Dell™ XPS™ 410 Service Manual

Notes, Notices, and Cautions

NOTE: A NOTE indicates important information that helps you make better use of your computer.

NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.

If you purchased a Dell™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.

Model DCTA

August 2006 Rev. A00

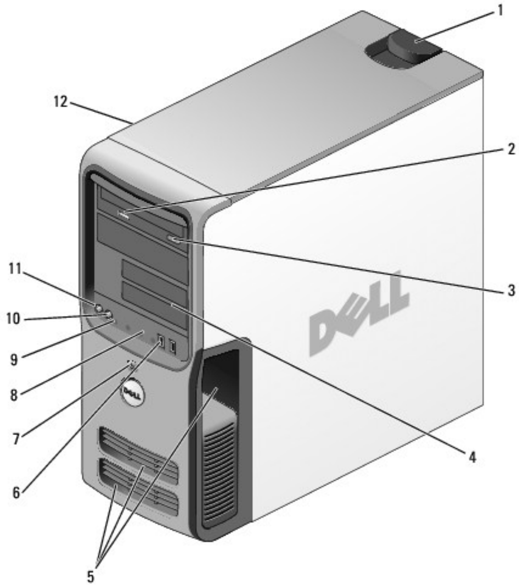
[Back to Contents Page](#)

About Your Computer

Dell™ XPS™ 410 Service Manual

- [Front View of the Computer](#)
- [Back View of the Computer](#)
- [Back Panel Connectors](#)

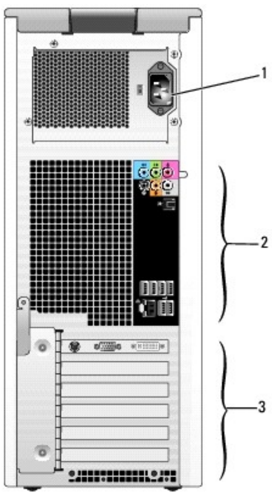
Front View of the Computer



1	cover release latch	Use this latch to remove the cover (see [Removing the Computer Cover](#)).
2	CD or DVD activity light	The CD or DVD drive light is on when the computer reads data from or writes data to the CD or DVD drive.
3	CD or DVD eject button	Press the CD or DVD eject button to eject a disc from the CD or DVD drive.
4	FlexBay drives (2)	Can contain an optional floppy drive or an optional Media Card Reader.
5	vents	For adequate cooling, do not block any of the vents. **NOTICE:** Ensure that there is a minimum of two inches of space between all vents and any object near the vents. **NOTICE:** Keep the vent area clean and dust-free to ensure that the system is adequately ventilated. Use only a dry cloth to clean the vent area to avoid water damage to the system.
6	USB 2.0 connectors (2)	Use the front USB connectors for devices that you connect occasionally, such as flash memory keys, cameras, or bootable USB devices. For more information on booting to a USB device see [System Setup Options](#). **NOTE:** It is recommended that you use the back USB connectors for devices that typically remain connected, such as printers and keyboards.
7	power button	Press the power button to turn on the computer. **NOTICE:** To avoid losing data, do not use the power button to turn off the computer. Instead, perform an operating system shutdown.
8	hard-drive activity light	The hard-drive light is on when the computer reads data from or writes data to the hard drive. The light may also be on when a device such as

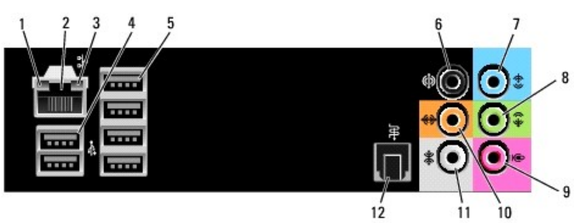
		a CD player is operating.
9	diagnostic lights (4)	Use the sequence of the diagnostic lights to help you troubleshoot a problem with your computer (see Diagnostic Lights).
10	headphone connector	Use the headphone connector to attach headphones and most kinds of speakers.
11	microphone connector	Use the microphone connector to attach a personal computer microphone for voice or musical input into a sound or telephony program.
12	Service Tag	Use the Service Tag to identify your computer when you access the Dell Support website or contact support.

Back View of the Computer



1	power connector	Insert the power cable.
2	back I/O connectors	Plug USB, network, S/PDIF, and audio devices into the appropriate connectors (see Back Panel Connectors).
3	card slots (6)	Access connectors for any installed PCI or PCI Express cards.

Back Panel Connectors



1	link integrity light	• Green — A good connection exists between a 10-Mbps network and the computer. • Orange — A good connection exists between a 100-Mbps network and the computer. • Yellow — A good connection exists between a 1000-Mbps (1-Gbps) network and the computer. • Off — The computer is not detecting a physical connection to the network.
2	network adapter connector	**NOTICE:** Do not plug a telephone cable into the network connector. Use the network adapter connector to attach your computer to a network or broadband device. Connect one end of a network cable to either a network jack or your network or broadband device, and then connect the other end of the network cable to the network

		adapter connector on your computer. A click indicates that the network cable has been securely attached. On computers with an additional network connector card, use the connectors on the card and on the back of the computer when setting up multiple network connections (such as a separate intra- and extranet). **NOTE:** It is recommended that you use Category 5 wiring and connectors for your network. If you must use Category 3 wiring, force the network speed to 10 Mbps to ensure reliable operation.
3	network activity light	Flashes a yellow light when the computer is transmitting or receiving network data. A high volume of network traffic may make this light appear to be in a steady "on" state.
4	USB 2.0 connectors (2) (rear dual)	Use the back, rear-dual USB connectors for devices that typically remain connected, such as printers and keyboards. **NOTE:** It is recommended that you use the front USB connectors for devices that you connect occasionally, such as joysticks, cameras, or bootable USB devices.
5	USB 2.0 connectors (4) (rear quad)	Use the back, rear-quad USB connectors for devices that typically remain connected, such as printers and keyboards. **NOTE:** It is recommended that you use the front USB connectors for devices that you connect occasionally, such as joysticks, cameras, or bootable USB devices.
6	surround sound connector	Use the (black) surround sound connector to attach multichannel-capable speakers. On computers with a sound card, use the connector on the card.
7	line-in connector	Use the (blue) line-in connector to attach a record/playback device such as a cassette player, CD player, or VCR. On computers with a sound card, use the connector on the card.
8	line-out/headphone connector	Use the (green) line-out connector to attach headphones and most speakers with integrated amplifiers. On computers with a sound card, use the connector on the card.
9	microphone connector	Use the (pink) microphone connector to attach a personal computer microphone for voice or musical input into a sound or telephony program. On computers with a sound card, use the connector on the card.
10	center/subwoofer LFE connector	Use the (orange) center/subwoofer connector to attach a center speaker or a single subwoofer. On computers with a sound card, use the connector on the card. **NOTE:** The LFE (Low Frequency Effects) Audio channel, found in digital surround sound audio schemes, carries only low frequency information of 80 Hz and below. The LFE channel drives a subwoofer to provide extremely low bass extension. Systems not using subwoofers can shunt the LFE information to the main speakers in the surround sound setup.
11	side surround sound connector	Use the (gray) side surround sound connector to attach multichannel-capable speakers. The side-surround output provides enhanced surround audio for computers with 7.1 speakers. On computers with a sound card, use the connector on the card.
12	S/PDIF connector	Use the S/PDIF connector to transmit digital audio without going through an analog audio conversion process. On computers with a sound card, use the connector on the card.

Back to Contents Page

Back to Contents Page

Advanced Troubleshooting

Dell™ XPS™ 410 Service Manual

Power Lights

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

The power button light located on the front of the computer illuminates and blinks or remains solid to indicate different states:

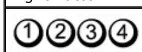
- If the power light is green and the computer is not responding.
  - Ensure the display is connected and powered on.
  - If the display is connected and powered on, see Diagnostic Lights.
- If the power light is blinking green, the computer is in standby mode. Press a key on the keyboard, move the mouse, or press the power button to resume normal operation.
- If the power light is off, the computer is either turned off or is not receiving power.
  - Reseat the power cable into both the power connector on the back of the computer and the electrical outlet.
  - If the computer is plugged into a power strip, ensure that the power strip is plugged into an electrical outlet and that the power strip is turned on. Also bypass power protection devices, power strips, and power extension cables to verify that the computer turns on properly.
  - Ensure that the electrical outlet is working by testing it with another device, such as a lamp.
  - Ensure that the main power cable and front panel cable are securely connected to the system board (see System Board Components).
- If the power light is blinking amber, the computer is receiving electrical power, but an internal power problem might exist.
  - Ensure that the voltage selection switch is set to match the AC power at your location (if applicable).
- If the power light is steady amber, a device might be malfunctioning or incorrectly installed.
  - Remove and then reinstall the memory modules (see Installing Memory).
  - Remove and then reinstall any cards (see Cards).
  - Remove and then reinstall the graphics card, if applicable (see Cards).
  - Ensure that all power cables are securely connected to the system board. (see System Board Components).

Diagnostic Lights

⚠ **CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

To help you troubleshoot a problem, your computer has four lights labeled 1, 2, 3, and 4 on the front panel (see Front View of the Computer). When the computer starts normally, the lights flash before turning off. If the computer malfunctions, the sequence of the lights help to identify the problem.

.

Light Pattern	**Problem Description**	**Suggested Resolution**
	The computer is in a normal "off" condition or a possible pre-BIOS failure has occurred. All four diagnostic lights display solid green and then turn off after the system successfully boots to the operating system.	- Plug the computer into a working electrical outlet (see Power Lights)
	A possible processor failure has occurred.	Reinstall the processor (see Installing the Processor) and restart the computer.

	Memory modules are detected, but a memory failure has occurred.	• If two or more memory modules are installed, remove the modules (see Removing Memory), then reinstall one module (see Installing Memory) and restart the computer. If the computer starts normally, continue to install additional modules (one at a time) until you have identified a faulty module or reinstalled all modules without error. • If available, install properly working memory of the same type into your computer (see Installing Memory).
	A possible graphics card failure has occurred.	• Reseat any installed graphics card (see Installing a PCI Express Card). • If available, install a working graphics card into your computer.
	A possible floppy drive or hard drive failure has occurred.	Reseat all power and data cables.
	A possible USB failure has occurred.	Reinstall all USB devices and check all cable connections.
	No memory modules are detected.	• If two or more memory modules are installed, remove the modules (see Removing Memory), then reinstall one module (see Installing Memory) and restart the computer. If the computer starts normally, continue to install additional modules (one at a time) until you have identified a faulty module or reinstalled all modules without error. • If available, install properly working memory of the same type into your computer (see Installing Memory).
	Memory modules are detected, but a memory configuration or compatibility error has occurred.	• Ensure that no special requirements for memory module/connector placement exist (see Memory). • Ensure that the memory you are using is supported by your computer (see Memory).
	A possible expansion card failure has occurred.	1. Determine if a conflict exists by removing a card (not a graphics card) and restarting the computer (see Cards). 2. If the problem persists, reinstall the card that you removed, then remove a different card and restart the computer. 3. Repeat this process for each card installed. If the computer starts normally, troubleshoot the last card removed from the computer for resource conflicts (see Resolving Software and Hardware Incompatibilities).
	The system is operating in quick resume mode.	• Press the power button • Move the mouse • Press any key on the keyboard • Press any key on the optional MCE remote control
	Another failure has occurred.	• Ensure that all hard drive and CD/DVD cables are properly connected to the system board (see System Board Components). • If there is an error message on your screen identifying a problem with a device (such as the floppy drive or hard drive), check the device to ensure that it is functioning properly. • If the operating system is attempting to boot from a device (such as the floppy drive or hard drive), check system setup (see System Setup Program) to ensure the boot sequence is correct for the devices installed on your computer.

Beep Codes

Your computer might emit a series of beeps during start-up if the monitor cannot display errors or problems. This series of beeps, called a beep code, identifies a problem. For example, beep code 1-3-1 consists of one beep, a burst of three beeps, and then one beep.This beep code tells you that the computer encountered a memory problem.

Reseating the memory modules (see Installing Memory) may fix the beep code errors in the following table. If the problem persists, see "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.

Code	Cause
1-3-1 through 2-4-4	Memory not being properly identified or used
4-3-1	Memory failure above address 0FFFFh

The following table lists beep codes for non memory related errors.

Code	Cause
1-1-2	Microprocessor register failure
1-1-3	NVRAM
1-1-4	ROM BIOS checksum failure
1-2-1	Programmable interval timer
1-2-2	DMA initialization failure
1-2-3	DMA page register read/write failure
3-1-1	Slave DMA register failure

3-1-2	Master DMA register failure
3-1-3	Master interrupt mask register failure
3-1-4	Slave interrupt mask register failure
3-2-2	Interrupt vector loading failure
3-2-4	Keyboard Controller Test failure
3-3-1	NVRAM power loss
3-3-2	NVRAM configuration
3-3-4	Video Memory Test failure
3-4-1	Screen initialization failure
3-4-2	Screen retrace failure
3-4-3	Search for video ROM failure
4-2-1	No time tick
4-2-2	Shutdown failure
4-2-3	Gate A20 failure
4-2-4	Unexpected interrupt in protected mode
4-3-3	Timer-chip counter 2 failure
4-3-4	Time-of-day clock stopped
4-4-1	Serial or parallel port test failure
4-4-4	Cache test failure

Message	**Possible Cause**	**Corrective Action**
`8042 Gate-A20 error`	The keyboard controller failed its test.	If you receive this message after you make changes in the system setup program, enter system setup (see Entering System Setup) program and restore the original value(s).
`Address Line Short!`	An error in the address decoding circuitry in the memory has occurred.	Reseat the memory modules (see Removing Memory).
`C: Drive Error` `C: Drive Failure`	The hard drive is not working or is not configured correctly.	Ensure that the drive is installed correctly in the computer and defined correctly in the system setup program (see Entering System Setup).
`Cache Memory Bad, Do Not Enable Cache`	The cache memory is not operating.	See "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.
`CH-2 Timer Error`	An error is occurring on the timer on the system board.	See "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.
`CMOS Battery State Low` `CMOS Checksum Failure` `CMOS System Options Not Set` `CMOS Display Type Mismatch` `CMOS Memory Size Mismatch` `CMOS Time and Date Not Set`	The system configuration information in the system setup program is incorrect or the battery charge may be low.	Enter the system setup program (see Entering System Setup), verify the system configuration, and then restart the computer.
`Diskette Boot Failure`	Drive A or B is present but has failed the BIOS POST.	Ensure that the drive is installed correctly in the computer and defined correctly in the system setup program (see Entering System Setup). Check the interface cable at both ends.
`DMA Error` `DMA 1 Error` `DMA 2 Error`	Error in the DMA controller on the system board.	The keyboard or system board (see Removing the System Board) may need to be replaced.
`FDD Controller Failure` `HDD Controller Failure`	The BIOS cannot communicate with the floppy drive or hard drive controller.	Ensure that the floppy drive or the hard drive (Installing a Hard Drive) is installed correctly in the computer and defined correctly in the system setup program (see Entering System Setup). Check the interface cable at both ends.
`INTR1 Error`	An interrupt channel on the system board failed to	The keyboard or system board (see Removing the System Board) may need to

INTR2 Error	POST.	be replaced.
Invalid Boot Diskette	The operating system cannot be located on drive A or drive C.	Enter the system setup program (see Entering System Setup)and confirm that drive A or drive C is properly identified.
Keyboard Error	The BIOS has detected a stuck key.	Ensure that nothing is resting on the keyboard; if a key appears to be stuck, carefully pry it up. If the problem persists, you may need to replace the keyboard.
KB/Interface Error	An error occurred with the keyboard connector.	Ensure that nothing is resting on the keyboard; if a key appears to be stuck, carefully pry it up. If the problem persists, you may need to replace the keyboard.
No ROM Basic	The operating system cannot be located on drive A or drive C.	Enter the system setup program (see Entering System Setup) and confirm that drive A or drive C is properly identified.

Dell Diagnostics

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: The Dell Diagnostics works only on Dell™ computers.

1. Turn on (or restart) your computer.
2. When the DELL™ logo appears, press <F12> immediately.

   If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop. Then shut down your computer (see "Turning Off Your Computer" on page 7) and try again.

3. When the boot device list appears, highlight **Boot to Utility Partition** and press <Enter>.
4. When the Dell Diagnostics **Main Menu** appears, select the test you want to run.

Dell Diagnostics Main Menu

1. After the Dell Diagnostics loads and the **Main Menu** screen appears, click the button for the option you want.

Option	Function
Express Test	Performs a quick test of devices. This test typically takes 10 to 20 minutes and requires no interaction on your part. Run **Express Test** first to increase the possibility of tracing the problem quickly.
Extended Test	Performs a thorough check of devices. This test typically takes an hour or more and requires you to answer questions periodically.
Custom Test	Tests a specific device. You can customize the tests you want to run.
Symptom Tree	Lists the most common symptoms encountered and allows you to select a test based on the symptom of the problem you are having.

2. If a problem is encountered during a test, a message appears with an error code and a description of the problem. Write down the error code and problem description and follow the instructions on the screen.
3. If you run a test from the **Custom Test** or **Symptom Tree** option, click the applicable tab described in the following table for more information.

Tab	Function
Results	Displays the results of the test and any error conditions encountered.
Errors	Displays error conditions encountered, error codes, and the problem description.
Help	Describes the test and may indicate requirements for running the test.
Configuration	Displays your hardware configuration for the selected device. The Dell Diagnostics obtains configuration information for all devices from system setup, memory, and various internal tests, and it displays the information in the device list in the left pane of the screen. The device list may not display the names of all the components installed on your computer or all devices attached to your computer.
Parameters	Allows you to customize the test by changing the test settings.

4. Close the test screen to return to the **Main Menu** screen. To exit the Dell Diagnostics and restart the computer, close the **Main Menu** screen.

Drivers

Identifying Drivers

If you experience a problem with any device, identify whether the driver is the source of your problem and, if necessary, update the driver.

Windows XP

1. Click the **Start** button and click **Control Panel**.
2. Under **Pick a Category**, click **Performance and Maintenance**.
3. Click **System**.
4. In the **System Properties** window, click the **Hardware** tab.
5. Click **Device Manager**.
6. Scroll down the list to see if any device has an exclamation point (a yellow circle with a [**!**]) on the device icon.

   If an exclamation point is next to the device name, you may need to reinstall the driver or install a new driver.

Reinstalling Drivers

NOTICE: Refer to the Dell Support website at **support.dell.com** for approved drivers for Dell™ computers. If you install drivers obtained from other sources, your computer might not work correctly.

Using Windows XP Device Driver Rollback

If a problem occurs on your computer after you install or update a driver, use Windows XP Device Driver Rollback to replace the driver with the previously installed version.

1. Click the **Start** button and click **Control Panel**.
2. Under **Pick a Category**, click **Performance and Maintenance**.
3. Click **System**.
4. In the **System Properties** window, click the **Hardware** tab.
5. Click **Device Manager**.
6. Right-click the device for which the new driver was installed and click **Properties**.
7. Click the **Drivers** tab.
8. Click **Roll Back Driver**.

If Device Driver Rollback does not resolve the problem, then use System Restore to return your computer to the operating state that existed before you installed the new driver.

Manually Reinstalling Drivers

1. After copying the required driver files to your hard drive, click the **Start** button and right-click **My Computer**.
2. Click **Properties**.
3. Click the **Hardware** tab and click **Device Manager**.

4. Double-click the type of device for which you are installing the driver.

5. Double-click the name of the device for which you are installing the driver.

6. Click the **Driver** tab and click **Update Driver**.

7. Click **Install from a list or specific location (Advanced)** and click **Next**.

8. Click **Browse** and browse to the location to which you previously extracted the driver files.

9. When the name of the appropriate driver appears, click **Next**.

10. Click **Finish** and restart your computer.

Resolving Software and Hardware Incompatibilities

If a device is not detected during the operating system setup or is detected but incorrectly configured, you can use the Hardware Troubleshooter to resolve the incompatibility.

To resolve incompatibilities using the Hardware Troubleshooter:

1. Click **Start**, then click **Help and Support**.

2. Type `hardware troubleshooter` in the **Search** field, then click the arrow to start the search.

3. Click **Hardware Troubleshooter** in the **Search Results** list.

4. In the **Hardware Troubleshooter** list, click **I need to resolve a hardware conflict on my computer**, and then click **Next**.

Back to Contents Page

[Back to Contents Page](#)

Before You Begin

Dell™ XPS™ 410 Service Manual

Getting Started

This manual provides procedures for removing and replacing the components in your computer. Unless otherwise noted, each procedure assumes that the following conditions exist:

- You have performed the steps in Turning Off Your Computer and Before Working Inside Your Computer in this section.
- You have read the safety information in your Dell™ *Product Information Guide.*
- A component can be replaced by performing the removal procedure in reverse order.

Recommended Tools

The procedures in this document may require the following tools:

- Small flat-blade screwdriver
- Phillips screwdriver
- Long Phillips screwdriver
- Flash BIOS update program (download from **support.dell.com**)

Turning Off Your Computer

NOTICE: To avoid losing data, save and close any open files and exit any open programs before you turn off your computer.

1. Shut down the operating system:

   a. Save and close any open files, exit any open programs, click the **Start** button, and then click **Shutdown**.

   b. In the **Shut Down Windows** window, select **Shut down**.

   The computer turns off after the operating system shutdown process finishes.

2. Ensure that the computer and any attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for 4 seconds.

Before Working Inside Your Computer

Use the following safety guidelines to help protect your computer from potential damage and to help ensure your own personal safety.

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

NOTICE: Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

NOTICE: When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

NOTICE: To avoid damaging the computer, perform the following steps before you begin working inside the computer.

1. Turn off your computer. See Turning Off Your Computer.

NOTICE: To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network port or device.

2. Disconnect any telephone or telecommunication lines from the computer.

3. Disconnect your computer and all attached devices from their electrical outlets, and then press the power button to ground the system board.

NOTICE: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate any static electricity that could harm internal components.

Back to Contents Page

[Back to Contents Page](#)

Removing and Installing Parts

Dell™ XPS™ 410 Service Manual

This chapter provides procedures for removing and installing the components in your computer. Unless otherwise noted, each procedure assumes that the following conditions exist:

- You have performed the steps in Turning Off Your Computer and Before Working Inside Your Computer.
- You have read the safety information in your Dell™ *Product Information Guide*.
- A component can be replaced by performing the removal procedure in reverse order.
- You have the tools listed in Recommended Tools.
- You are familiar with Turning Off Your Computer.

When working inside the computer, be aware that the heat-sink assembly may be very hot during normal operation. Be sure that it has had sufficient time to cool before you touch it.

Removing the Computer Cover

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

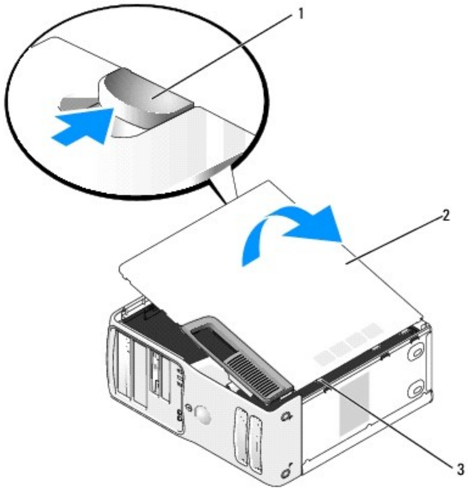
NOTICE: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate any static electricity that could harm internal components.

1. Follow the procedures in Before You Begin.
2. If you have installed a security cable, remove it from the security cable slot.

NOTICE: Ensure that sufficient space exists to support the removed cover—at least 30 cm (1 ft) of desk top space.

NOTICE: Ensure that you are working on a level, protected surface to avoid scratching either the computer or the surface on which it is resting.

3. Lay your computer on its side with the computer cover facing up.
4. Pull back the cover release latch on the top panel.



1	cover release latch	2	computer cover	3	hinge tabs (3)

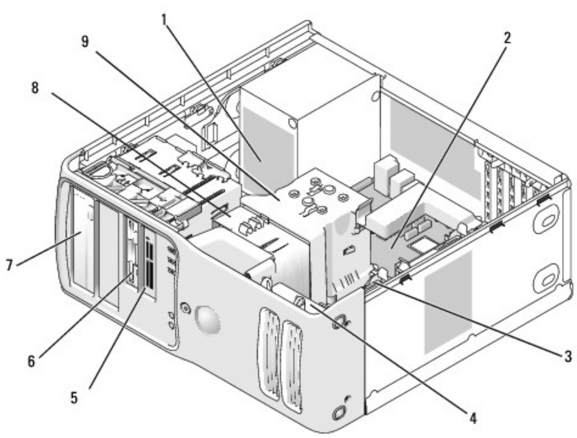
5. Locate the three hinge tabs on the bottom edge of the computer.

6. Grip the sides of the computer cover and pivot the cover up.

7. Lift the cover away and set it aside in a secure location.

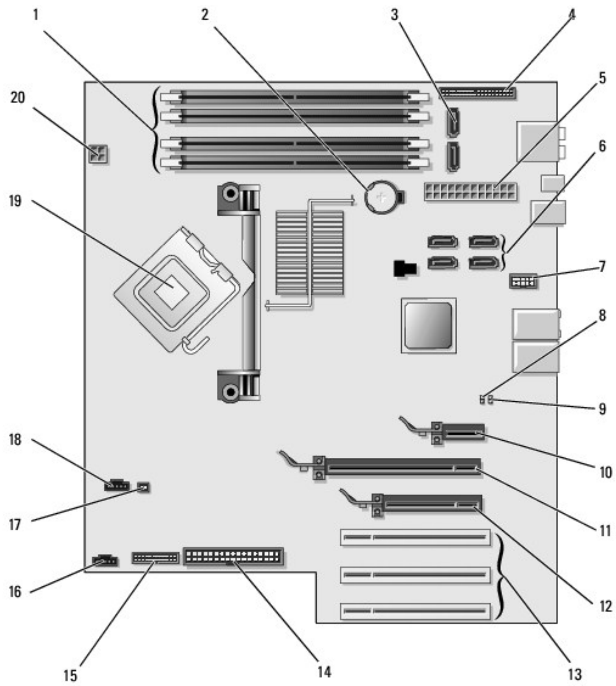
Inside View of Your Computer

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.



1	power supply	2	system board	3	hard drive
4	card fan	5	media card reader (optional)	6	floppy drive (optional)
7	CD or DVD drive	8	processor fan	9	processor shroud and processor

System Board Components



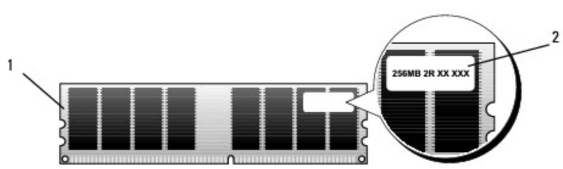
1	memory module connectors (1, 2, 3, 4)	2	battery socket (BATTERY)	3	SATA Connectors SATA0, SATA1
4	front panel I/O connector	5	main power connector	6	SATA connectors (4) (SATA2, SATA3, SATA4, SATA5
7	FlexBay USB connector	8	clear CMOS jumper (CLRCMOS)	9	password jumper (CLRPSWD)
10	PCI Express x1 card connector	11	PCI Express x16 card connector	12	PCI Express x4 card connector
13	PCI card connectors	14	floppy drive connector (FLOPPY)	15	PS/2 and Serial connector
16	card fan connector	17	thermal sensor connector	18	processor fan connector
19	processor and heat sink connector	20	processor power connector		

Memory

You can increase your computer memory by installing memory modules on the system board. For information on the type of memory supported by your computer, see Memory.

Memory Overview

- Memory modules should be installed in *pairs of matched memory size, speed, and technology for best performance*. Otherwise, the computer will continue to operate, but with a slight reduction in performance. See the label on the module to determine the module's capacity.



1	memory module	2	memory module capacity label

NOTE: Always install memory modules in the order indicated on the system board.

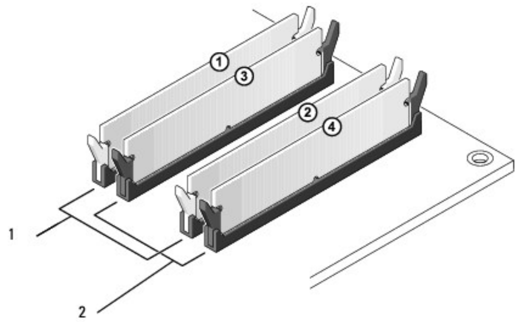
The recommended memory configurations are:

- A pair of matched memory modules installed in connectors DIMM_1 and DIMM_2

or

- A pair of matched memory modules installed in connectors DIMM_1 and DIMM_2 and another matched pair installed in connectors DIMM_3 and DIMM_4

- If you install mixed pairs of DDR2 533-MHz (PC2-4300), DDR2 667-MHz (PC2-5300), and DDR2 800-MHz (PC2-6400) memory, the modules function at the slowest speed installed.
- Be sure to install a single memory module in the DIMM_1 connector, the connector closest to the processor, before you install modules in the other connectors.
- While installing memory modules, ensure that you do not mix ECC and non-ECC memory.



1	Channel A: matched pair of memory modules in connectors DIMM_1 and DIMM_2 (white securing clips)	2	Channel B: matched pair of memory modules in connectors DIMM_3 and DIMM_4 (black securing clips)

NOTE: Memory purchased from Dell is covered under your computer warranty.

NOTICE: If you remove your original memory modules from the computer during a memory upgrade, keep them separate from any new modules that you may have, even if you purchased the new modules from Dell. If possible, *do not* pair an original memory module with a new memory module. Otherwise, your computer may not start properly. You should install your original memory modules in pairs either in connectors DIMM_1 and DIMM_2 or connectors DIMM_3 and DIMM_4.

Addressing Memory With 4-GB Configurations

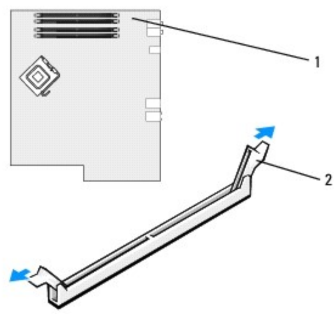
Your computer supports a maximum of 4 GB of memory when you use four 1-GB DIMMs. Current operating systems, such as Microsoft® Windows® XP, can only use a maximum of 4 GB of address space; however, the amount of memory available to the operating system is less than 4 GB. Certain components within the computer require address space in the 4-GB range. Any address space reserved for these components cannot be used by computer memory.

Installing Memory

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

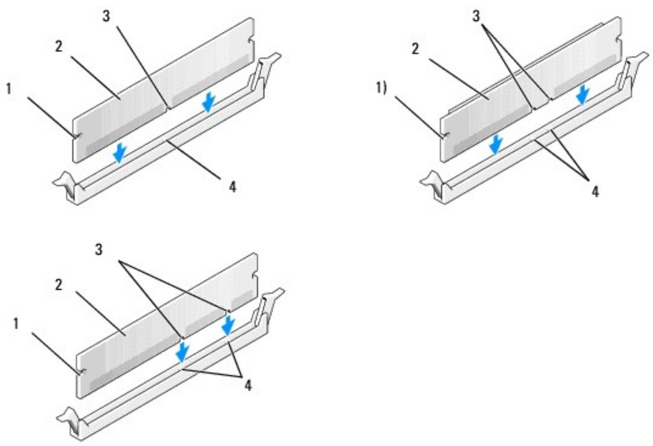
NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer.

1. Follow the procedures in Before You Begin.
2. Remove the computer cover (see Removing the Computer Cover).
3. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.
4. Press out the securing clip at each end of the memory module connector.



1	memory module connectors (4)	2	securing clip (2)

5. Align the notch on the bottom of the module with the crossbar in the connector.

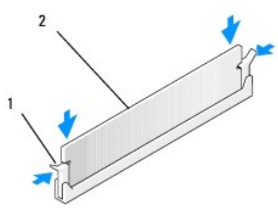


1	cutouts (2)	2	memory module	3	notch
4	crossbar				

NOTICE: To avoid damage to the memory module, press the module straight down into the connector while you apply equal force to each end of the module.

6. Insert the module into the connector until the module snaps into position.

   If you insert the module correctly, the securing clips snap into the cutouts at each end of the module.



1	memory module	2	securing clip (2)

7. Replace the computer cover (see Replacing the Computer Cover).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

8. Connect your computer and devices to electrical outlets, and then turn them on.

9. Right-click the **My Computer** icon, then click **Properties**.

10. Click the **General** tab.

11. To verify that the memory is installed correctly, check the amount of memory (RAM) listed.

Removing Memory

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer.

1. Follow the procedures in Before You Begin.

2. Remove the computer cover (see Removing the Computer Cover).

3. Press outward the securing clip at each end of the memory module connector.

4. Grasp the module and pull up.

   If the module is difficult to remove, gently ease the module back and forth to remove it from the connector.

Cards

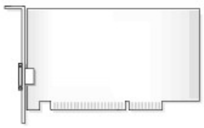
CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer.

Your Dell™ computer provides the following slots for PCI and PCI Express cards:

- Three PCI card slots
- One PCI Express x1 card slot
- One PCI Express x16 card slot
- One PCI Express x4 card slot

PCI Cards



- If you are installing or replacing a card, follow the procedures in the next section.
- If you are removing but not replacing a card, see Removing a PCI Card.
- If you are replacing a card, remove the current driver for the card from the operating system.
- If you are installing or replacing a PCI Express card, see Installing a PCI Express Card.

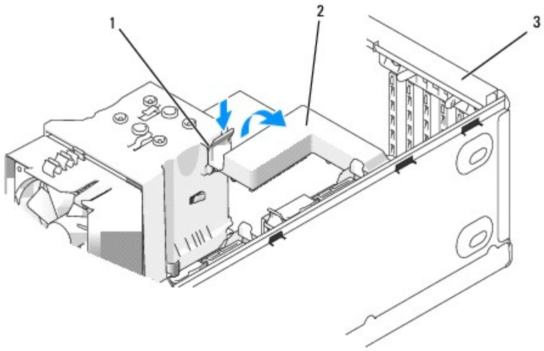
Installing a PCI Card

NOTE: Dell offers an optional customer kit for Audigy II and IEEE 1394 PCI add-in-cards that includes a front-mounted IEEE 1394 connector.

1. Follow the procedures in Before You Begin.

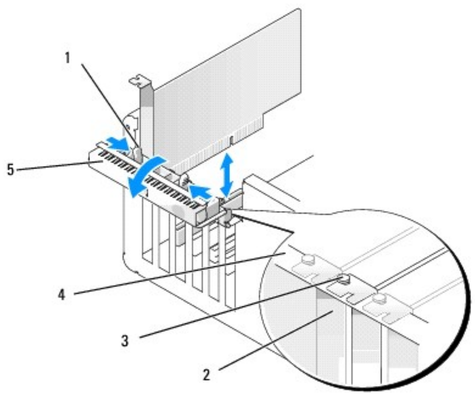
2. Remove the computer cover (see Removing the Computer Cover).

3. If your computer includes a card retention mechanism to secure the x16 card, press the release tab downward gently and then pivot the mechanism upward to access the card slots.



1	release tab	2	card retention mechanism	3	card retention door

4. Push the two release tabs on the card retention door from the inside to pivot the door open; the hinged door will remain in the open position.



1	release tabs (2)	2	filler bracket	3	alignment guide
4	alignment bar	5	card retention door		

5. If you are installing a new card, remove the filler bracket to create a card-slot opening. Then continue with step 7.

6. If you are replacing a card that is already installed in the computer, remove the card.

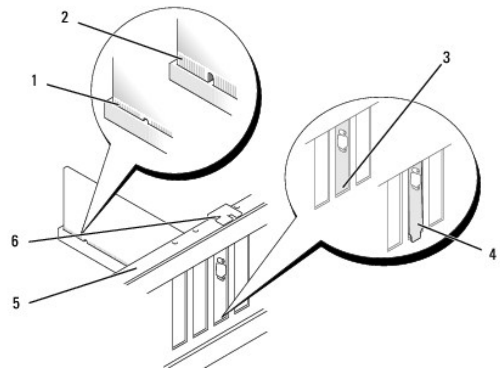
   If necessary, disconnect any cables connected to the card. Grasp the card by its top corners, and ease it out of its connector.

7. Prepare the card for installation.

   See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.

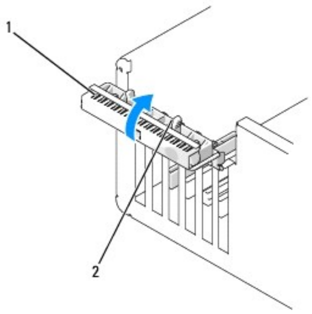
CAUTION: Some network adapters automatically start the computer when they are connected to a network. To guard against electrical shock, be sure to unplug your computer from its electrical outlet before installing any cards.

8. Place the card in the connector and press down firmly. Ensure that the card is seated fully in the slot.



1	fully seated card	2	not fully seated card	3	bracket within slot
4	bracket caught outside of slot	5	alignment bar	6	alignment guide

9. Before you close the card retention door, ensure that:
   - The tops of all cards and filler brackets are flush with the alignment bar.
   - The notch in the top of the card or filler bracket fits around the alignment guide.



1	card retention door	2	release tabs (2)

10. Close the card retention door by snapping it into place to secure the cards.

NOTICE: Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer cover from closing properly or cause damage to the equipment.

11. Connect related cables to the card.

    See the documentation for the card for information about the card cable connections.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.

12. Before you pivot the card retention mechanism back in place, ensure that:
    - The tops of all cards and filler brackets are flush with the alignment bar.
    - The notch in the top of the card or filler bracket fits around the alignment guide.

13. Snap the card retention mechanism into place, securing the PCI card.

14. Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

15. If you installed a sound card:
    a. Enter system setup, select **Integrated Audio Controller**, and then change the setting to **Off**.
    b. Connect external audio devices to the sound card connectors. Do not connect external audio devices to the integrated microphone, speaker/headphone, or line-in connectors on the back panel.

16. If you installed an add-in network adapter and want to disable the integrated network adapter:
    a. Enter system setup, select **Integrated NIC Controller,** and then change the setting to **Off**.

b. Connect the network cable to the add-in network adapter connectors. Do not connect the network cable to the integrated connector on the back panel.

17. Install any drivers required for the card as described in the card documentation.

Removing a PCI Card

1. Follow the procedures in Before You Begin.

2. Remove the computer cover (see Removing the Computer Cover).

3. If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

NOTE: Installing filler brackets over empty card-slot openings is necessary to maintain FCC certification of the computer. The brackets also keep dust and dirt out of your computer.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.

4. Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

5. Remove the card driver from the operating system.

6. If you removed a sound card:

   a. Enter system setup, select **Integrated Audio Controller,** and then change the setting to **On**.

   b. Connect external audio devices to the audio connectors on the back panel of the computer.

7. If you removed an add-in network connector:

   a. Enter system setup, select **Integrated NIC Controller,** and then change the setting to **On**.

   b. Connect the network cable to the integrated connector on the back panel of the computer.

PCI Express Cards

Your computer supports:

- One PCI Express x1 card
- One PCI Express x16 card
- One PCI Express x4 card

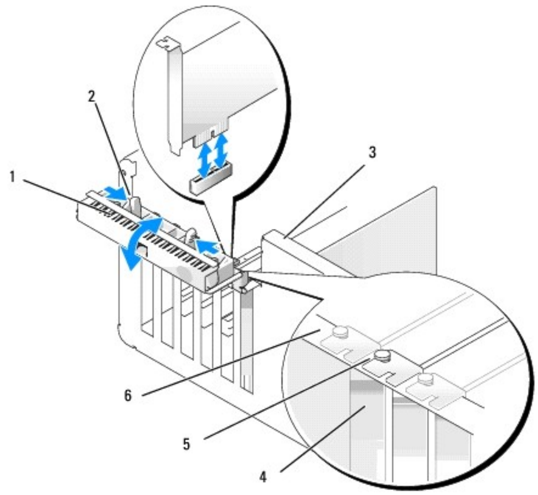
If you are installing or replacing a PCI Express card, follow the procedures in the next section. If you are removing but not replacing a card, see Removing a PCI Express Card.

If you are replacing a card, remove the current driver for the card from the operating system.

If you are installing or replacing a PCI card, see Installing a PCI Card.

Installing a PCI Express Card

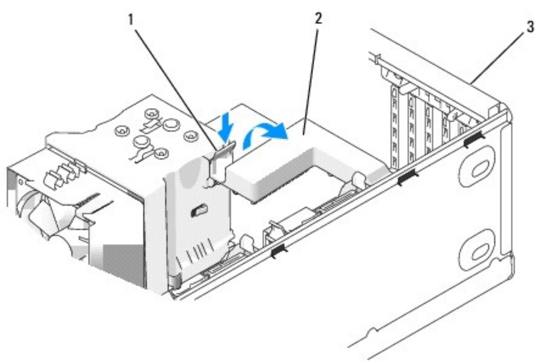
1. Follow the procedures in Before You Begin.



1	card retention door	2	release tabs (2)	3	lever on chassis wall (may not be present on all computers)
4	filler bracket	5	alignment guide	6	alignment bar

2. If present on your computer, rotate the lever on the chassis wall upward.

3. Push the two release tabs on the card retention door from the inside to pivot the door open; the hinged door will remain in the open position.



1	release tab	2	card retention mechanism	3	card retention door

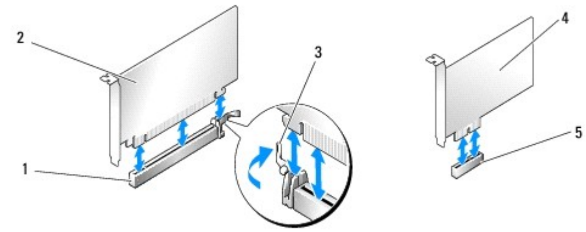
NOTE: If your computer includes a card retention mechanism consider pivoting it out of the way to gain easier access to the PCI card slots. Press the release tab downward gently and then pivot the mechanism upward.

4. If you are installing a new card, remove the filler bracket to create a card-slot opening. Then continue with step 7.

5. If you are replacing a card that is already installed in the computer, remove the existing card.

   If necessary, disconnect any cables connected to the card. If your card includes a retention mechanism, remove the top of the retention mechanism by pressing the tab and pulling up on the top.

6. Pull the securing tab, grasp the card by its top corners, and then ease it out of its connector.



1	PCI Express x16 card slot	2	PCI Express x16 card	3	securing tab
4	PCI Express x1 card	5	PCI Express x1 card slot		

7. Prepare the card for installation.

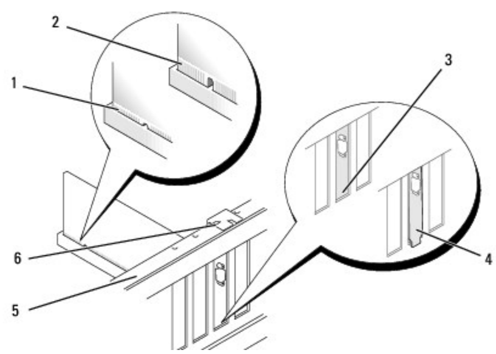
   See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.

CAUTION: Some network adapters automatically start the computer when they are connected to a network. To guard against electrical shock, be sure to unplug your computer from its electrical outlet before installing any cards.

8. If you are installing the card into the x16 card connector, position the card so that the securing slot is aligned with the securing tab.

NOTICE: Ensure that you release the securing tab to seat the card. If the card is not installed correctly, you may damage the system board.

9. Place the card in the connector and press down firmly. Ensure that the card is fully seated in the slot.



1	fully seated card	2	not fully seated card	3	bracket within slot
4	bracket caught outside of slot	5	alignment bar	6	alignment guide

10. Ensure that:

    - The tops of all cards and filler brackets are flush with the alignment bar.
    - The notch in the top of the card or filler bracket fits around the alignment guide.

11. If you removed a card retention mechanism, snap it into place, securing the PCI-E card.

NOTICE: Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer cover from closing properly or cause damage to the equipment.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.

12. Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

13. If you installed a sound card:

    a. Enter system setup, select **Integrated Audio Controller**, and then change the setting to **Off**.

    b. Connect external audio devices to the sound card's connectors. Do not connect external audio devices to the integrated microphone, speaker/headphone, or line-in connectors on the back panel.

14. If you installed an add-in network adapter and want to disable the integrated network adapter:

    a. Enter system setup, select **Integrated NIC Controller,** and then change the setting to **Off**.

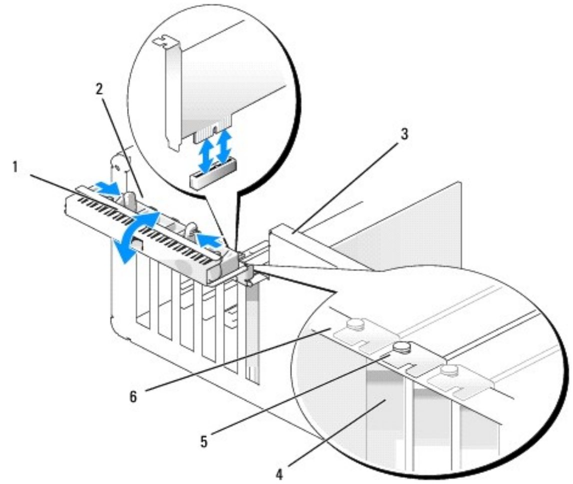
b. Connect the network cable to the add-in network adapter's connectors. Do not connect the network cable to the integrated connector on the back panel.

15. Install any drivers required for the card as described in the card documentation.

Removing a PCI Express Card

1. Follow the procedures in Before You Begin.

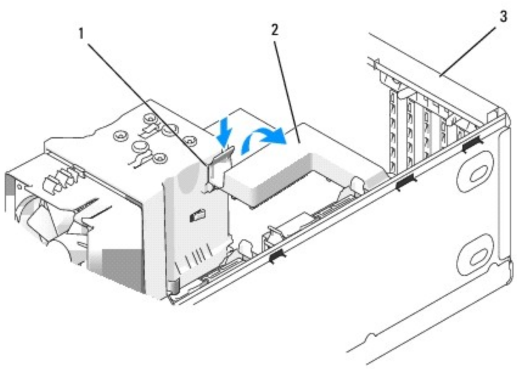
2. Remove the computer cover (see Removing the Computer Cover).



1	card retention door	2	release tabs (2)	3	lever on chassis wall (may not be present on all computers)
4	filler bracket	5	alignment guide	6	alignment bar

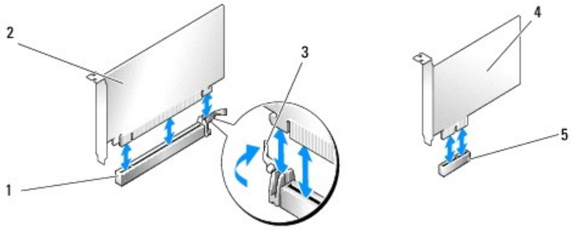
3. If present on your computer, rotate the lever on the chassis wall upward.

4. Push the two release tabs on the card retention door from the inside to pivot the door open; the hinged door will remain in the open position.



1	release tab	2	card retention mechanism	3	card retention door

5. If your computer includes a card retention mechanism to secure the x16 card, press the release tab downward gently and then pivot the mechanism upward to access the card slots.



1	PCI Express x16 card slot	2	PCI Express x16 card	3	securing tab
4	PCI Express x1 card	5	PCI Express x1 card slot		

NOTICE: Ensure that you release the securing tab to unseat the card. If the card is not removed correctly, the system board may be damaged.

6. Release the securing tab on the card slot to unseat the card.

7. If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

NOTE: Installing filler brackets over empty card-slot openings is necessary to maintain FCC certification of the computer. The brackets also keep dust and dirt out of your computer.

8. Pivot the card retention mechanism back in place and snap the release tab into place.

9. Close the card retention door to snap it into place, securing the card(s).

NOTE: For full-length PCI-E cards, if a "piano" bracket is present on your computer you need to rotate it down into place.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.

10. Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

11. Remove the card driver from the operating system.

12. If you removed a sound card:
    a. Enter system setup, select **Integrated Audio Controller**, and then change the setting to **On**.
    b. Connect external audio devices to the integrated audio connectors on the back panel of the computer.

13. If you removed an add-in network connector:
    a. Enter system setup, select **Integrated NIC Controller**, and then change the setting to **On**.
    b. Connect the network cable to the integrated connector on the back panel of the computer.

NOTE: Install any drivers required for the card as described in the card documentation.

Drive Panels

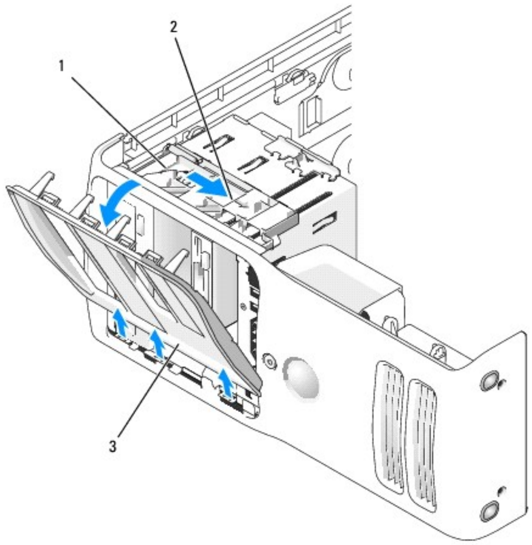
CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

Removing the Drive Panel

1. Follow the procedures in Before You Begin.

2. Remove the computer cover (see Removing the Computer Cover).

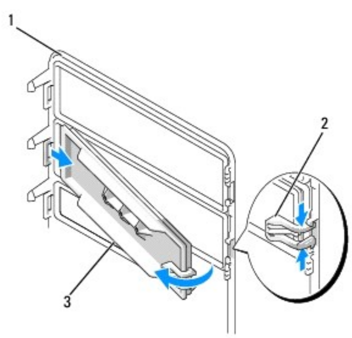


1	sliding plate	2	sliding plate lever	3	drive panel

3. Pull the sliding plate lever to the right and hold in place while pushing the panel from the inside. Pivot the panel to the left to release it from its side hinges.

4. Set the drive panel aside in a secure location.

Removing the Drive-Panel Insert



1	drive panel	2	drive-panel insert tab	3	drive-panel insert

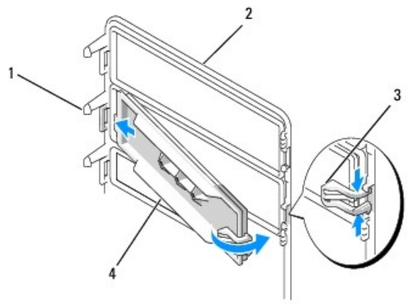
1. Turn the drive panel sideways and find the tip of the drive-panel insert tab that latches over a tab on the right side of the drive panel.

2. Pull the inner tip of the drive-panel insert tab away from the drive panel.

3. Pivot the drive-panel insert out and away from the drive panel.

4. Set the drive-panel insert aside in a secure location.

Installing the Drive-Panel Insert



1	center drive-panel tab	2	drive panel	3	drive-panel insert tab
4	drive-panel insert				

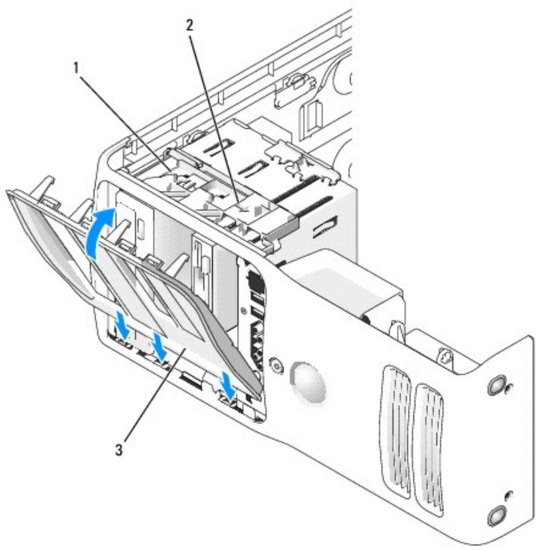
1. Slide the tab on the left side of the drive-panel insert under the center drive panel tab.

2. Rotate the drive-panel insert into place and snap the drive-panel insert tab over the corresponding tab on the drive panel.

3. Ensure that the drive-panel insert is correctly seated in the drive panel.

Installing the Drive Panel

1. Follow the procedures in Before You Begin.



1	sliding plate	2	sliding plate lever	3	drive panel

2. Align the drive panel tabs with the side-door hinges.

3. Rotate the drive panel toward the computer until the sliding plate lever clicks into place and the drive panel snaps into place on the front panel.

Drives

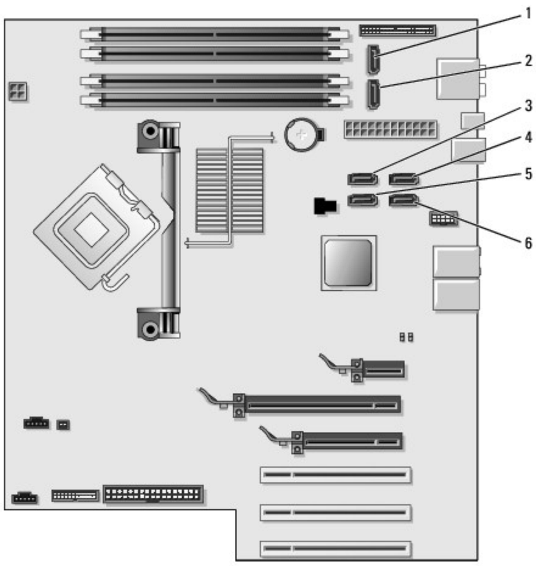
Your computer supports:

- Two hard drives (Serial ATA)
- Two CD or DVD drives
- Two FlexBay drives (can contain an optional floppy drive and optional Media Card Reader)

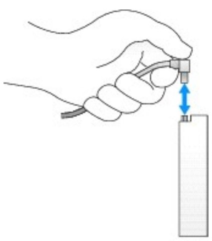
General Installation Guidelines

Connect hard drives to the connectors labeled "SATA0" and "SATA1", starting with SATA0. Connect CD/DVD drives to the connectors labeled "SATA4" and "SATA5", starting with SATA4.

Serial ATA hard drives and CD/DVD drives are connected to connectors labeled "SATA0" to "SATA5" on the system board.



1	SATA0	2	SATA1	3	SATA2
4	SATA3	5	SATA4	6	SATA5



When connecting and disconnecting a SATA cable, hold the cable by the connector at each end.

Hard Drive

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

NOTICE: To avoid damage to the drive, do not set it on a hard surface. Instead, set the drive on a surface, such as a foam pad, that will sufficiently cushion it.

NOTICE: If you are replacing a hard drive that contains data, back up your files before you begin this procedure

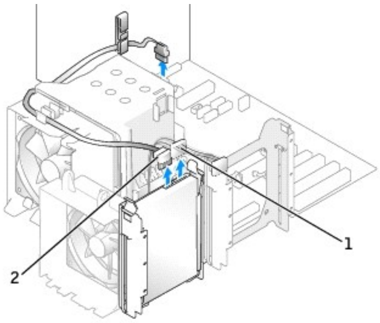
NOTE: If removing or installing the hard drive changes the drive configuration, you must reflect the changes in the BIOS. Go to the "Drives" section of the BIOS and under SATA 0 through 5, set the SATA ports to the correct configuration.

Removing a Hard Drive

1. Follow the procedures in Before You Begin.

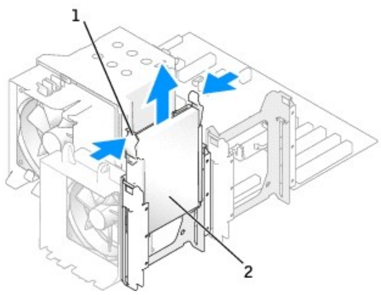
2. Remove the computer cover (see Removing the Computer Cover).

3. Disconnect the power and hard drive cables from the drive.



1	power cable	2	hard drive cable

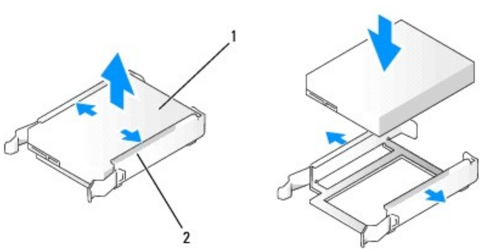
4. Press in on the tabs on each side of the drive and slide the drive up and out.



1	tabs (2)	2	hard drive

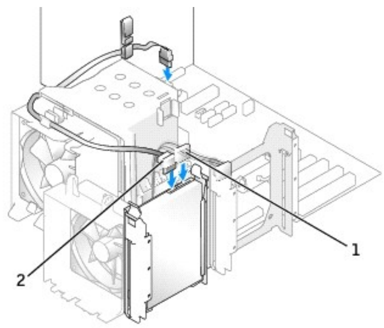
Installing a Hard Drive

1. Follow the procedures in Before You Begin.
2. Remove the computer cover (see Removing the Computer Cover).
3. Unpack the replacement hard drive, and prepare it for installation.
4. Check the documentation for the drive to verify that the drive is configured for your computer.
5. If your replacement hard drive does not have the hard drive bracket attached, remove the bracket from the old hard drive by unsnapping it from the drive.
6. Snap the hard drive bracket onto the replacement hard drive.
7. Install the hard drive into the computer by sliding the drive into place until you feel it click into place.



1	hard drive	2	hard drive bracket

8. Connect the power and hard drive cables to the hard drive.



1	power cable	2	hard drive cable

9. Check all connectors to be certain that they are properly cabled and firmly seated.

10. Replace the computer cover (see Replacing the Computer Cover).

NOTICE: To connect a network cable, first plug the cable in to the network wall jack and then plug the cable into the computer.

11. Connect your computer and devices to electrical outlets, and then turn them on.

    See the documentation that came with the hard drive for instructions about installing any software required for the operation of the hard drive.

Adding a Second Hard Drive

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

NOTICE: To avoid damage to the drive, do not set it on a hard surface. Instead, set the drive on a surface, such as a foam pad, that will sufficiently cushion it.

1. Check the documentation for the drive to verify that it is configured for your computer.

2. Follow the procedures in Before You Begin.

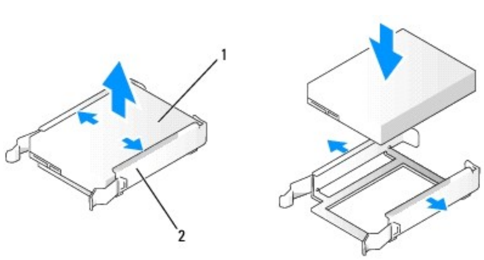
3. Remove the computer cover (see Removing the Computer Cover).

4. Press in on the tabs on each side of the hard drive bracket in the empty drive bay and slide the bracket up and out.

5. Snap the hard drive bracket onto the new hard drive.

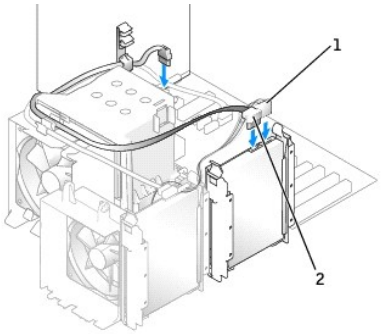
NOTICE: Do not install any drive into the lower hard-drive bay until you have removed the hard drive bracket from the inside of the hard drive bay.

6. Slide the new hard drive into empty bay until you feel a click.



1	hard drive	2	hard drive bracket

7. Connect the power and hard drive cables to the drive. Refer to General Installation Guidelines to identify the hard drive cable connectors on the system board.



1	power cable	2	hard drive cable

8. Check all connectors to be certain that they are properly cabled and firmly seated.

9. Replace the computer cover (Replacing the Computer Cover).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

10. Connect your computer and devices to electrical outlets, and then turn them on.

    See the documentation that came with the drive for instructions on installing any software required for drive operation.

Floppy Drive

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

NOTE: If you are adding a floppy drive, see Installing a Floppy Drive.

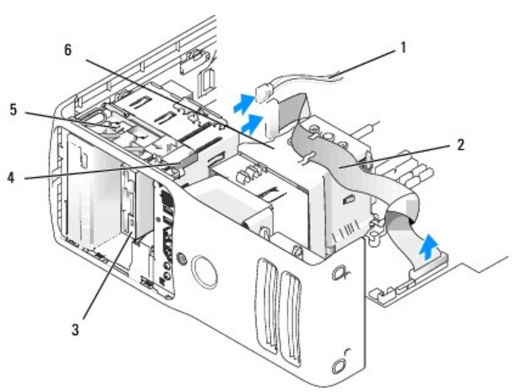
Removing a Floppy Drive

1. Follow the procedures in Before You Begin.

2. Remove the computer cover (see Removing the Computer Cover).

3. Disconnect the power and floppy drive cables from the back of the floppy drive.

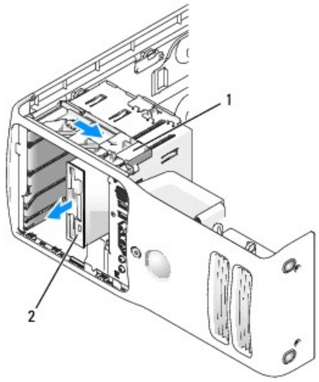
4. Unhook floppy drive cable from the clips on the processor shroud. Disconnect the other end of the floppy drive cable from the system board. Remove the floppy drive cable from the computer.



1	power cable	2	floppy drive cable	3	floppy drive
4	sliding plate lever	5	sliding plate	6	processor shroud

5. Pull the sliding plate to the right and hold in place.

6. Slide the floppy drive out of the floppy drive bay.



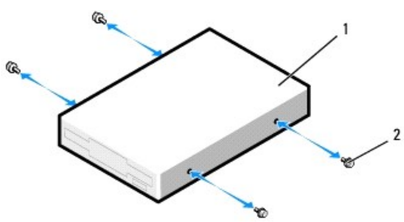
1	sliding plate	2	floppy drive

Installing a Floppy Drive

1. Follow the procedures in Before You Begin.

2. Remove the computer cover (see Removing the Computer Cover).

3. If you are installing a new floppy drive, remove the shoulder screws from the inside of the drive-panel insert and attach the screws to the new drive.



1	floppy drive	2	shoulder screws (4)

4. Slide the floppy drive into the floppy drive bay until the sliding plate clicks into place and the drive snaps into position.

5. Attach the power cable to the floppy drive. Attach the floppy-drive cable to the floppy drive and to the system board.

6. Check all cable connections. Fold the ribbon cable and place it across the top of the processor shroud inserting the sides under the clips. Ensure that the cable does not block airflow for the fan and cooling vents.

7. Replace the computer cover.

NOTICE: To connect a network cable, first plug the cable in to the network wall jack and then plug it in to the computer.

8. Connect your computer and devices to their electrical outlets, and then turn them on.

   See the documentation that came with the floppy drive for instructions on installing any software required for the operation of the drive.

9. Enter system setup (see Entering System Setup) and select the appropriate **Diskette Drive** option.

10. Verify that your computer works correctly by running the Dell Diagnostics (see Dell Diagnostics).

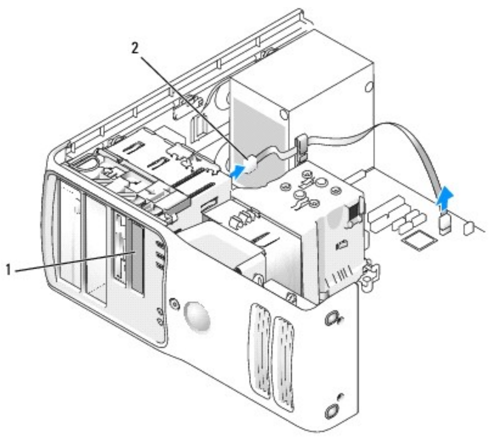
Media Card Reader

Removing a Media Card Reader

⚠ **CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

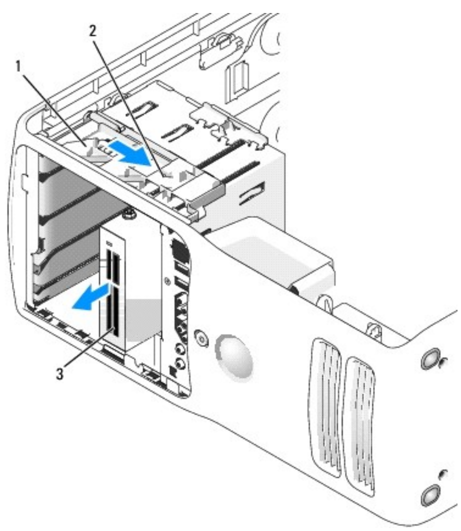
NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in Before You Begin.
2. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.
3. Remove the computer cover (see Removing the Computer Cover).
4. Remove the drive panel (see Removing the Drive Panel).
5. Remove the drive panel insert (see Removing the Drive-Panel Insert).



1	Media Card Reader (optional)	2	USB cable

6. Disconnect the USB cable from the back of the Media Card Reader. Disconnect the other end of the cable from the USB connector from the system board (see System Board Components). Remove the cable from any clips and lift out of the computer.



1	sliding plate	2	sliding plate lever	3	Media Card Reader (optional)

7. Pull the sliding plate to the right and hold in place. Then, slide the drive out the front of the computer.

8. Replace the drive panel (see Installing the Drive Panel).

9. Replace the computer cover (see Replacing the Computer Cover).

Installing a Media Card Reader

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in Before You Begin.

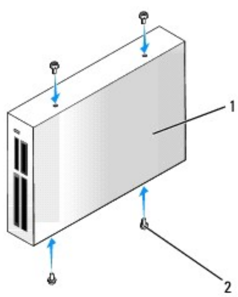
2. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.

3. Remove the computer cover (see Removing the Computer Cover).

4. Remove the drive panel (see Removing the Drive Panel).

5. Remove the drive panel insert (see Removing the Drive-Panel Insert).

6. Remove the Media Card Reader from its packaging. Remove the shoulder screws from the inside of the drive-panel insert and attach the screws to the new drive.

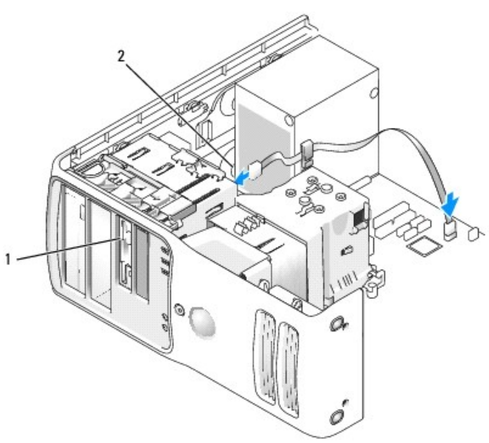


1	Media Card Reader	2	shoulder screws (4)

7. Gently slide the drive into place until you feel a click or feel the drive securely installed.

   Ensure that the Media Card Reader is installed before the USB cable is connected.

8. Connect the USB cable to the back of the Media Card Reader and to the USB connector on the system board (see System Board Components).



1	Media Card Reader (optional)	2	USB cable		

9. Route the USB cable through the cable routing clip.

10. Replace the computer cover (see Replacing the Computer Cover).

CD/DVD Drive

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

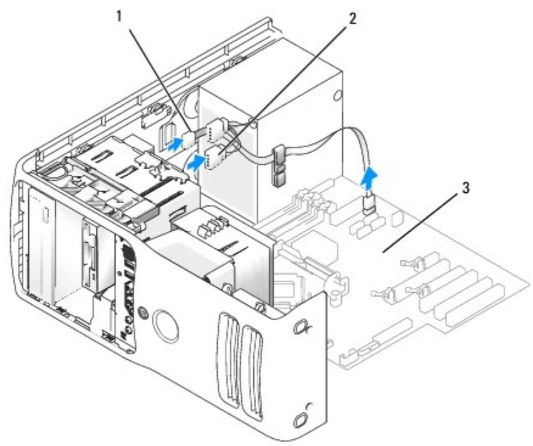
NOTE: If removing or installing the drive changes the drive configuration, you must reflect the changes in the BIOS. Go to the "Drives" section of the BIOS and under SATA 0 through 5, set the SATA ports to the correct configuration.

Removing a CD/DVD Drive

1. Follow the procedures in Before You Begin.

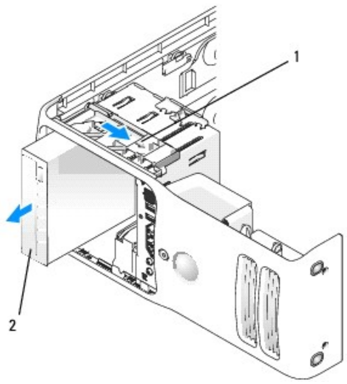
2. Remove the computer cover (see Removing the Computer Cover).

3. Disconnect the power cable from the back of the drive and the CD/DVD drive cable from the back of the drive and the system board.



1	CD/DVD drive cable	2	power cable	3	system board

4. Slide the drive release mechanism to the right to release the shoulder screw and slide the drive out to remove it from the drive bay.



1	sliding plate	2	CD drive

Installing a CD/DVD Drive

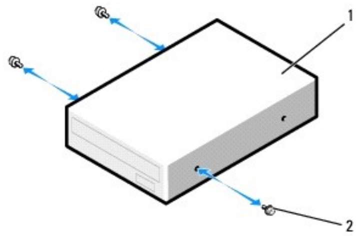
1. Follow the procedures in Before You Begin.

2. Remove the computer cover (see Removing the Computer Cover).

3. If you are installing a new drive, unpack the drive and prepare it for installation.

   Check the documentation that accompanied the drive to verify that the drive is configured for your computer.

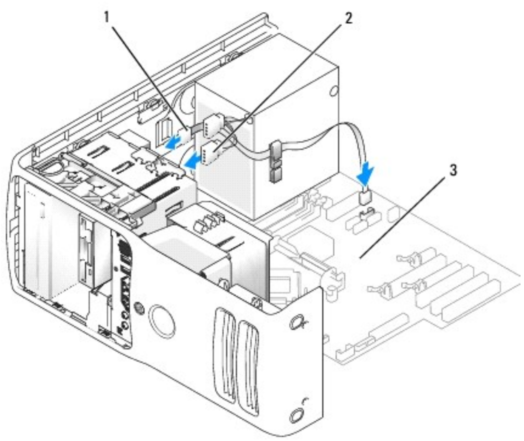
4. If you are installing a new drive, remove the drive panel insert (see Removing the Drive-Panel Insert). Then, remove three shoulder screws from the inside of the drive-panel insert and attach the screws to the new drive.



1	CD/DVD drive	2	shoulder screws (3)

5. Slide the drive into the drive bay until the drive clicks into position.

6. Connect the power cable to the drive and the CD/DVD cable to the drive and system board.



1	CD/DVD cable	2	power cable	3	system board

7. Check all cable connections, and fold cables out of the way to provide airflow for the fan and cooling vents.

8. Replace the computer cover (see Replacing the Computer Cover).

NOTICE: To connect a network cable, first plug the cable in to the network wall jack and then plug it in to the computer.

9. Connect your computer and devices to their electrical outlets, and then turn them on.

   See the documentation that came with the drive for instructions on installing any software required for drive operation.

10. Enter system setup (see Entering System Setup) and select the appropriate **Drive** option.

11. Verify that your computer works correctly by running the Dell Diagnostics (see Dell Diagnostics).

Battery

Replacing the Battery

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer.

A coin-cell battery maintains computer configuration, date, and time information. The battery can last several years. If you have to repeatedly reset time and date information after turning on the computer, replace the battery.

CAUTION: A new battery can explode if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

To replace the battery:

1. Enter the system setup program and record the values for all the screens (see Entering System Setup) so that you can restore the correct settings after installing the new battery.

2. Follow the procedures in Before You Begin.

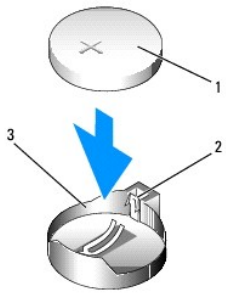
3. Remove the computer cover (see Removing the Computer Cover).

4. Locate the battery socket (see System Board Components).

NOTICE: If you pry the battery out of its socket with a blunt object, be careful not to touch the system board with the object. Ensure that the object is inserted between the battery and the socket before you attempt to pry out the battery. Otherwise, you may damage the system board by prying off the socket or by breaking circuit traces on the system board.

5. Remove the battery by carefully prying it out of its socket with your fingers or with a blunt, nonconducting object, such as a plastic screwdriver.

6. Insert the new battery into the socket with the side labeled "+" facing up, and then snap the battery into place.



1	battery	2	tab	3	battery socket

7. Replace the computer cover (see Replacing the Computer Cover).

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

8. Connect your computer and devices to electrical outlets, and then turn them on.

9. Enter system setup and restore the settings you recorded in step 1 (see Entering System Setup).

10. Properly dispose of the old battery.

Power Supply

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer.

Removing the Power Supply

1. Follow the procedures in Before You Begin.

2. Remove the computer cover (see Removing the Computer Cover).

3. Disconnect the DC power cables from the system board and the drives.

   NOTE: Note the routing of the DC power cables underneath the tabs in the computer frame as you remove them from the system board and drives. You must route these cables properly when you replace them to prevent them from being pinched or crimped.

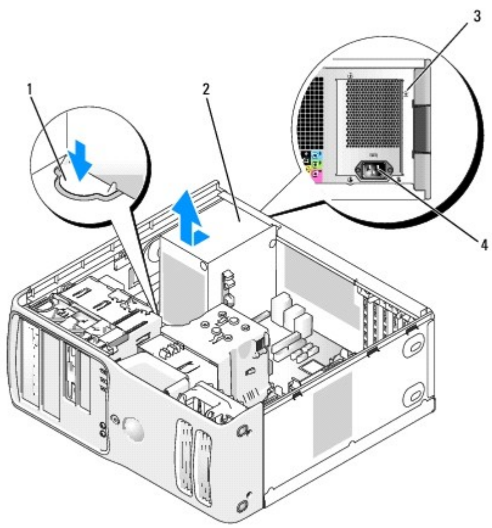
4. Remove any cables from the cable routing clip on the power supply.

5. Remove the four screws that attach the power supply to the back of the computer frame.

6. Press the release button located on the floor of the computer frame.

7. Slide the power supply approximately 1 inch towards the front of the computer.

8. Lift the power supply out of the computer.



1	release button	2	power supply	3	screws (4)
4	AC power connector				

Installing the Power Supply

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

1. Slide the power supply into place.

2. Replace the four screws that secure the power supply to the back of the computer frame.

3. Reconnect the DC power cables.

4. Connect the AC power cable to the connector.

5. Run the cables underneath the clips, and press the clips to close them over the cables.

6. Replace the computer cover (see Replacing the Computer Cover).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug the cable into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.

Processor

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer.

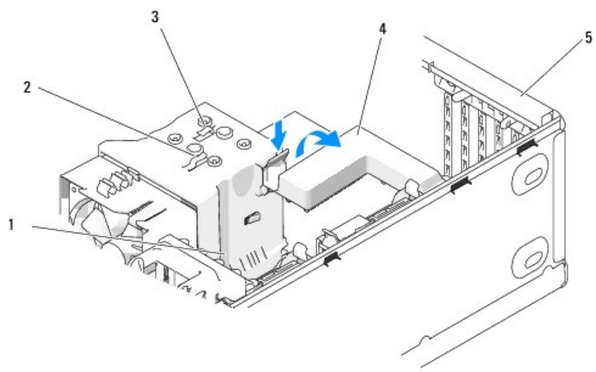
Removing the Processor

1. Follow the procedures in Before You Begin.

2. Remove the computer cover (see Removing the Computer Cover).

3. If your computer includes a card retention mechanism to secure the x16 card, press the release tab downward gently and then pivot the mechanism upward.

4. Unhook the floppy drive cable from clips on processor shroud and move it out of the way.

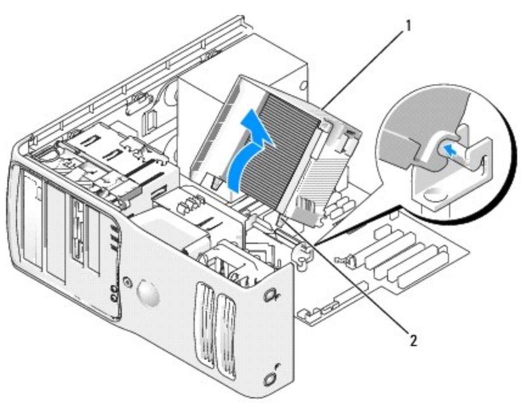


1	heat-sink screws (2)	2	ribbon cable clips (2)	3	release tab
4	card retention mechanism	5	card retention door		

5. Use a long Phillips screwdriver to loosen the two captive screws, one on each side of the plastic heat- sink assembly shield.

CAUTION: The heat-sink assembly may be very hot during normal operation. Be sure that it has had sufficient time to cool before you touch it.

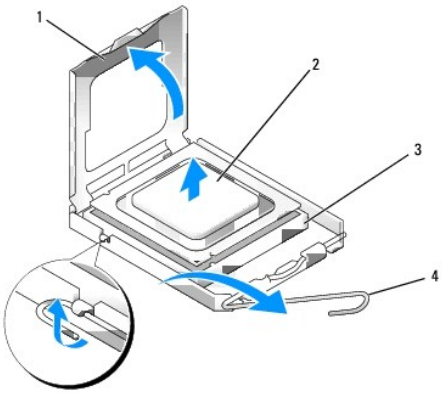
6. Rotate the heat-sink assembly toward the rear of the computer, and remove it from the computer.



1	heat sink and fan shroud assembly	2	captive screw housing (2)

NOTICE: If you are installing a processor upgrade kit from Dell, discard the original heat sink. If you are *not* installing a processor upgrade kit from Dell, reuse the original heat sink when you install your new processor.

7. Place your finger upon the hook end of the release lever, then push down and out to release it from the tab that secures it



1	processor cover	2	processor	3	processor socket
4	release lever				

8. Release the release lever and lift the processor cover.

NOTICE: When the release lever is freed, the processor may shift in place. Before securing the processor cover after it has been opened, ensure that the notches on the processor are aligned with the notches on the socket.

NOTICE: When replacing the processor, do not touch any of the pins inside the socket or allow any objects to fall on the pins in the socket.

9. Gently remove the processor from the socket.

   Leave the release lever extended in the release position so that the socket is ready for the new processor.

Installing the Processor

NOTICE: Ground yourself by touching an unpainted metal surface on the back of the computer.

NOTICE: When replacing the processor, do not touch any of the pins inside the socket or allow any objects to fall on the pins in the socket.

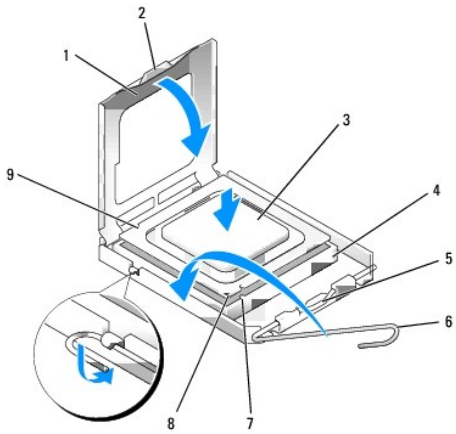
1. Unpack the new processor, being careful not to touch the underside of the processor.

NOTICE: You must position the processor correctly in the socket to avoid permanent damage to the processor and the computer when you turn on the computer.

2. If the release lever on the socket is not fully extended, move it to that position.

3. Orient the front and rear alignment notches on the processor with the front and rear alignment notches on the socket.

4. Align the pin-1 corners of the processor and socket.



1	processor cover	2	securing tab	3	processor
4	processor socket	5	center cover latch	6	release lever
7	front alignment notch	8	socket and processor pin-1 indicator	9	rear alignment notch

NOTICE: To avoid damage, ensure that the processor aligns properly with the socket, and do not use excessive force when you install the processor.

5. Set the processor lightly in the socket and ensure that the processor is positioned correctly.

6. When the processor is fully seated in the socket, close the processor cover.

   Ensure that the securing tab on the processor cover is positioned underneath the center cover latch on the socket.

7. Pivot the socket release lever back toward the socket and snap it into place beneath the securing tab.

NOTICE: If you are *not* installing a processor upgrade kit from Dell, reuse the original heat-sink assembly when you replace the processor.

If you installed a processor replacement kit from Dell, return the original heat-sink assembly and processor to Dell in the same package in which your replacement kit was sent.

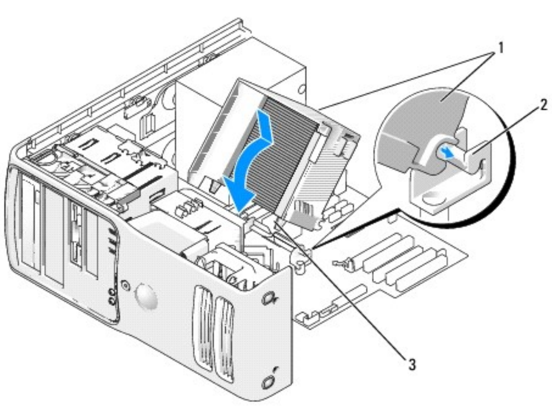
8. Install the heat-sink assembly:

   a. Place the heat-sink assembly back onto the heat-sink assembly bracket.

   b. Rotate the heat-sink assembly down towards the computer base and tighten the two captive screws.

NOTICE: Ensure that the heat sink is correctly seated and secure.

9. Place the floppy ribbon cable back across the top of the processor shroud inserting the sides under the clips. Ensure that the cable does not block airflow from the fan and cooling vents



1	heat sink and fan shroud assembly	2	heat-sink assembly bracket	3	captive screw housing (2)

10. Replace the computer cover (see Replacing the Computer Cover).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug the cable into the computer.

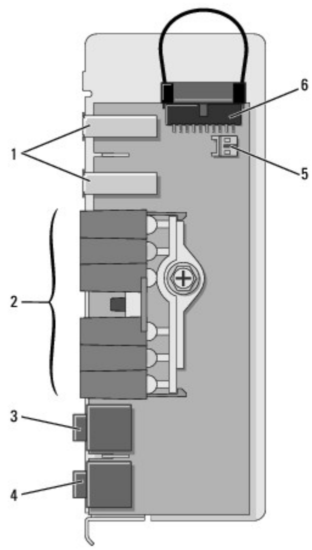
11. Connect your computer and devices to electrical outlets, and turn them on.

I/O Panel

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

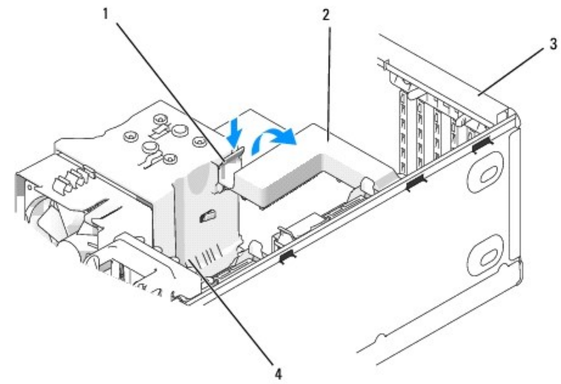
I/O-Panel Components



1	USB port	2	diagnostic, hard drive activity, and network lights	3	headphones connector
4	microphone connector	5	thermal sensor connector	6	Integrated audio connector with jumper block installed

Removing the I/O Panel

1. Follow the procedures in Before You Begin.
2. Remove the computer cover (see Removing the Computer Cover).
3. If your computer includes a card retention mechanism to secure the x16 card, press the release tab downward gently and then pivot the mechanism upward.
4. Unhook the floppy drive cable from clips on processor shroud and move it out of the way.

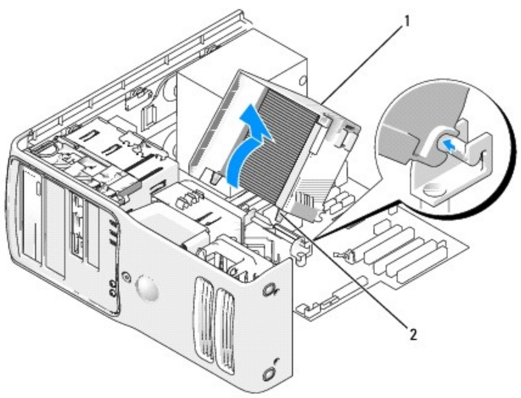


1	release tab	2	card retention mechanism	3	card retention door
4	heat sink captive screws (2)				

5. Use a long Phillips screwdriver to loosen the two captive screws, one on each side of the heat-sink assembly.

CAUTION: The heat-sink assembly may be very hot during normal operation. Be sure that it has had sufficient time to cool before you touch it.

6. Rotate the heat-sink assembly towards the rear of the computer, and remove it from the computer.

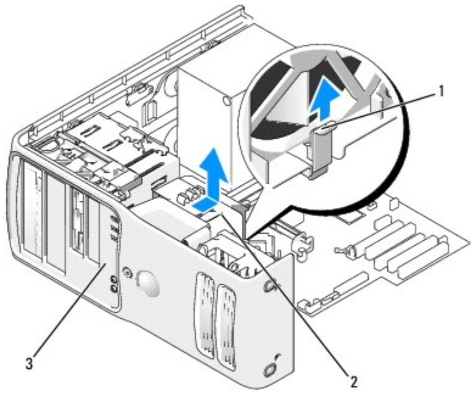


1	heat sink and fan shroud assembly	2	captive screw housing (2)

7. Place the heat-sink assembly on its side in a safe place.

8. Disconnect the system fan cable from the system board.

9. Ensure that all cables have been removed from the routing clips on the top of the system fan assembly.



1	fan release lever	2	fan	3	drive panel

10. Lift the fan release lever, then slide the fan toward the back of the computer to release the four fan tabs from the four slots in the bottom cover.

11. Remove the fan from the computer.

12. Disconnect the control-panel cable from the I/O panel connector by pulling with the cable loop.

13. If present, disconnect the thermal sensor cable (twisted pair) from the I/O panel.

14. Remove the drive panel (see Removing the Drive Panel).

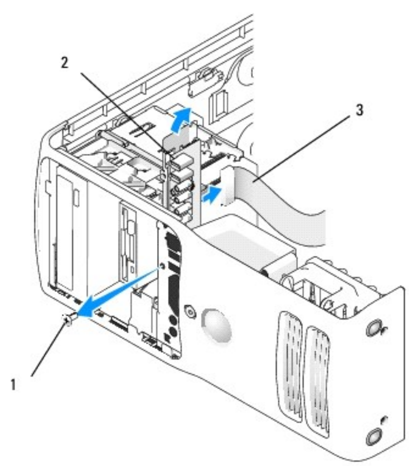
15. If an optional sound card is installed, disconnect the cable from the top edge of the I/O panel. Otherwise, a jumper block is installed.

NOTE: If the I/O panel has a jumper block installed and the replacement has no jumper block, then remove it from this I/O panel and install it in the replacement I/O panel.

16. If an optional IEEE 1394 cable is installed in the front port, remove the cable from the front of the computer by following the instructions that came with the connector.

17. Remove the mounting screw from the front of the I/O panel.

18. Remove the I/O panel from the computer.



1	mounting screw	2	I/O panel	3	control-panel cable

Installing the I/O Panel

CAUTION: When reinstalling the fan, ensure that you do not pinch the wires that run between the system board and the fan.

Follow the removal procedure (Removing the I/O Panel) in reverse order, ensuring that the tabs on the top panel, bottom panel, and front panel are secure.

Processor Fan

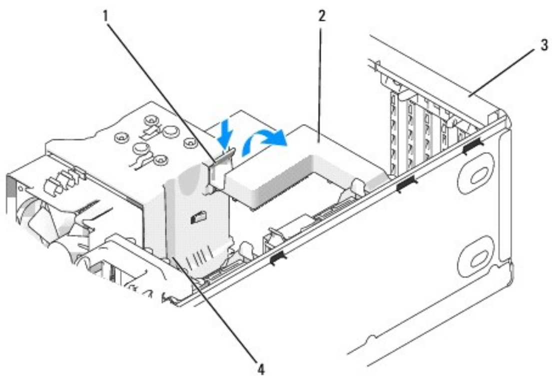
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer.

Removing the Processor Fan

1. Follow the procedures in Before You Begin.
2. Remove the computer cover (see Removing the Computer Cover).
3. If your computer includes a card retention mechanism to secure the x16 card, press the release tab downward gently and then pivot the mechanism upward.
4. Unhook floppy drive cable from the clips on processor shroud and move out of the way.

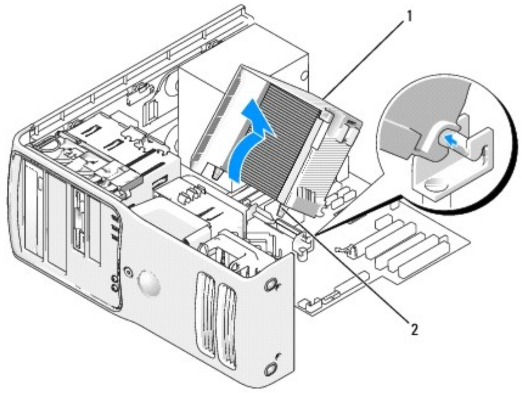


1	release tab	2	card retention mechanism	3	card retention door
4	heat sink captive screws (2)				

5. Use a long Phillips screwdriver to loosen the two captive screws, one on each side of the heat-sink assembly.

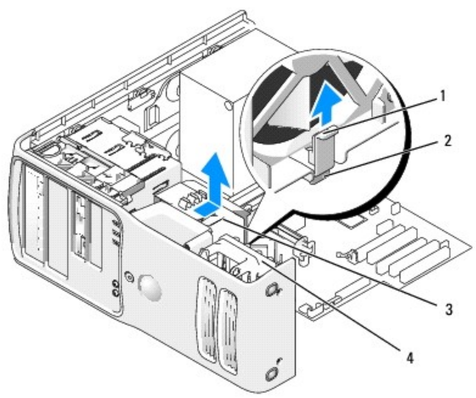
CAUTION: The heat-sink assembly may be very hot during normal operation. Be sure that it has had sufficient time to cool before you touch it.

6. Rotate the heat-sink assembly towards the rear of the computer, and remove it from the computer.



1	heat sink and fan shroud assembly	2	captive screw housing (2)

7. Place the heat-sink assembly on its side in a safe place.
8. Disconnect the system fan cable from the system board.
9. Ensure that all cables have been removed from the routing clips on the top of the system fan assembly.



1	fan release lever	2	fan release lever tab	3	processor fan
4	card fan				

10. Lift the fan release lever, then slide the fan toward the back of the computer to release the four fan tabs from the four keyhole slots in the bottom cover.
11. Remove the fan from the computer.

Installing the Processor Fan

When reinstalling the fan, ensure that you do not pinch the wires that run between the system board and the fan.

NOTICE: Ensure that the four fan tabs are fully inserted into the four keyhole slots in the bottom cover so that the fan can slide back fully into position. Ensure that the fan release lever tab is seated into its slot in the bottom cover.

Follow the removal procedure (Removing the Processor Fan) in reverse order.

Card Fan

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

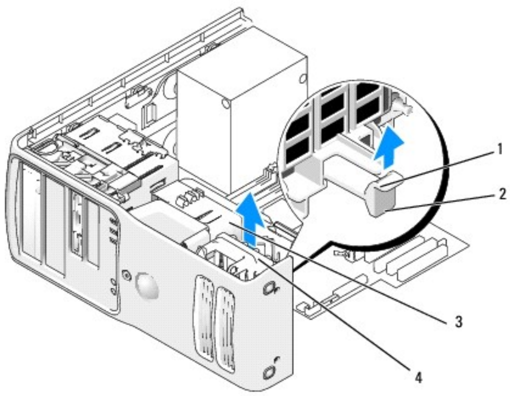
Removing the Card Fan

1. Follow the procedures in Before You Begin.

2. Remove the computer cover (see Removing the Computer Cover).

3. Disconnect the card fan cable from the system board.

4. Remove any cables from the routing clips on the top of the card fan assembly.



1	fan release lever	2	fan release lever tab	3	processor fan
4	card fan				

5. Lift the fan release lever, then slide the fan toward the back of the computer to release the four fan tabs from the four keyhole slots in the bottom cover.

6. Remove the fan from the computer being careful of the front hard drive's power and hard drive cables.

Installing the Card Fan

When reinstalling the fan, ensure that you do not pinch any wires that run near the fan.

NOTICE: Ensure that the four fan tabs are fully inserted into the four keyhole slots in the bottom cover so that the fan can slide back fully into position. Ensure that the fan release lever tab is seated into its slot in the bottom cover.

Follow the removal procedure (Removing the Card Fan) in reverse order.

System Board

Removing the System Board

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

NOTICE: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate any static electricity that could harm internal components.

1. Shut down the computer through the **Start** menu.

2. Ensure that your computer and attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your computer, turn them off now.

NOTICE: To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network port or device.

3. Disconnect any telephone or telecommunication lines from the computer.

4. Disconnect your computer and all attached devices from their electrical outlets, and then press the power button to ground the system board.

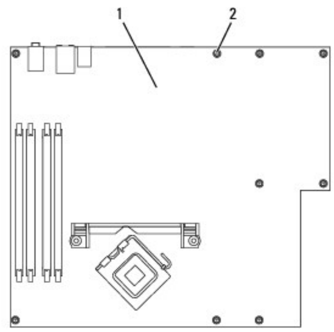
5. Open the computer cover (see Removing the Computer Cover).

6. Remove any components that restrict access to the system board (CD/DVD drive(s), floppy drive, hard drive, I/O panel).

7. Remove the heat-sink assembly and processor.

8. Disconnect all cables from the system board.

9. Remove any memory modules that you are transferring to the new system board (see Removing Memory).



1	system board	2	screws (10)

10. Remove the 10 screws from the system board.

11. Slide the system board assembly toward the front of the computer, and then lift the board away.

12. Place the system board assembly that you just removed next to the replacement system board to ensure that it is identical.

Installing the System Board

1. Gently align the board into the chassis and slide it toward the back of the computer.

2. Replace the screws on the system board.

3. Replace any components and cables that you removed from the system board.

4. Install the memory modules that were removed from the old system board (see Installing Memory).

5. Reconnect all cables to their connectors at the back of the computer.

6. Replace the computer cover (see Replacing the Computer Cover).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug the cable into the computer. Connect your computer and devices to electrical outlets, and turn them on.

If the new system board requires flashing the BIOS refer to Flashing the BIOS.

Replacing the Computer Cover

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

1. Ensure that all cables are connected, and fold cables out of the way.

   Gently pull the power cables toward you so that they do not get caught underneath the drives.

2. Ensure that no tools or extra parts are left inside the computer.

3. Lower the cover into place:

   a. Pivot the cover down.

   b. Press down on the right side of the cover until it closes.

   c. Press down on the left side of the cover until it closes.

4. Ensure that both sides of the cover are locked. If not, repeat all of step 3.

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

5. Connect your computer and devices to electrical outlets, and then turn them on.

Back to Contents Page

Specifications

Dell™ XPS™ 410 Service Manual

Processor	
Processor type	Intel® Pentium® 4 Intel® Pentium® D Intel® Core™ 2 Duo
Level 2 (L2) Cache	at least 2 MB on Intel Pentium D, Pentium 4, and Core processors

Memory	
Type	dual-channel 533-, 667-, and 800-MHz DDR2
Memory connectors	four
Memory capacities	512 MB or 1 GB
Maximum memory	4 GB
BIOS address	F0000h

Computer Information	
Chipset	Intel P965 Express Chipset
DMA channels	eight
Interrupt levels	24
BIOS chip (NVRAM)	4 MB
NIC	Integrated Intel 82566DC Gigabit Network Connection
System clock	800- or 1066-MHz data rate (depending on your processor)

Video	
Type	PCI Express

Audio	
Type	Sigmatel 9227 audio codec Internal 7.1 channel or PCI option cards

Expansion Bus	
Bus type	PCI 32-bit (PCI Specification 2.2) PCI Express x1, x4, and x16 (PCI express 1.1a)
Bus speed	PCI: 33 MHz PCI Express:100 MHz
Bus throughput	PCI Express: x1 slot bidirectional speed - 500 MB/s x4 slot bidirectional speed - 2 GB/s x16 slot bidirectional speed - 8 GB/s
PCI	
connectors	three
connector size	120 pins
connector data width (maximum)	32 bits

PCI Express (x1)	
connector	one x1
connector size	36 pins
connector data width (maximum)	1 PCI Express lane
PCI Express (x4)	
connector	one x4 (x8 connector wired as x4 electrically)
connector size	98 pins
connector data width (maximum)	4 PCI Express lanes
PCI Express (x16)	
connector	one x16
connector size	164 pins
connector data width (maximum)	16 PCI Express lanes

Drives	
Externally accessible:	two 3.5-inch drive bays (FlexBay) two 5.25-inch drive bays
Available devices	serial ATA drives, floppy drive, Media Card Reader, DVD drive, and DVD/CD-RW combo drive
Internally accessible:	two 3.5-inch hard-drive bays

Connectors	
External connectors:	
Video (external card)	15-pin VGA connector 28-pin DVI connector
Network adapter	RJ-45 connector
USB	two front-panel, six back-panel, and two internal USB 2.0-compliant connectors.
Audio	seven back-panel connectors for line-in, line-out, microphone, rear surround, side surround, center/subwoofer Low Frequency Effects (LFE) channel, and S/PDIF; two front-panel connectors for headphones/microphone
System board connectors:	
Serial ATA	six 7-pin connectors
FlexBay Drive	USB 9-pin header for optional Media Card Reader (3.5-inch bay devices)
Fan	5-pin connectors
PCI	three 120-pin connectors
PCI Express x1	36-pin connector
PCI Express x4 /x8	98-pin connector
PCI Express x16	164-pin connector
Thermal sensor 1x2	2-pin connector
PS/2 and serial port connector 2x12	24-pin connector
Floppy	33-pin connector

Controls and Lights	
Power control	push button
Power light	green light — Blinking green in sleep state; solid green for power-on state. amber light — Blinking amber indicates a problem with the power supply inside the computer. If the system cannot boot and there is a solid amber light, this indicates a problem with the system board (see Power Lights).
Hard-drive access light	green
Link integrity light (on integrated network adapter)	green light — A good connection exists between a 10-Mbps network and the computer.

	orange light — A good connection exists between a 100-Mbps network and the computer. off (no light) — The computer is not detecting a physical connection to the network.
Activity light (on integrated network adapter)	yellow light — Blinking indicates activity on the network.
Diagnostic lights	four lights on the front panel (see Diagnostic Lights)
Standby power light	AUXPWR on the system board

Power	
DC power supply:	
Wattage	375 W
Heat dissipation	1280 BTU/hr Note: Heat dissapation is calculated based upon the power supply wattage rating.
Voltage (see the safety instructions in the *Product Information Guide* for important voltage setting information)	90 to 135 V and 180 to 265 V at 50/60 Hz
Backup battery	3-V CR2032 lithium coin cell

Physical	
Height	46.05 cm (18.13 in)
Width	18.75 cm (7.38 in)
Depth	45.42 cm (17.88 in)
Weight	12.7 kg (28 lb)

Environmental	
Temperature:	
Operating	10° to 35°C (50° to 95°F)
Storage	–40° to 65°C (–40° to 149°F)
Relative humidity	20% to 80% (noncondensing)
Maximum vibration:	
Operating	0.25 G at 3 to 200 Hz at 0.5 octave/min
Storage	0.5 G at 3 to 200 Hz at 1 octave/min
Maximum shock:	
Operating	bottom half-sine pulse with a change in velocity of 20 inches/sec (50.8 cm/sec)
Storage	27-G faired square wave with a velocity change of 200 inches/sec (508 cm/sec)
Altitude:	
Operating	–15.2 to 3048 m (–50 to 10,000 ft)
Storage	–15.2 to 10,668 m (–50 to 35,000 ft)

Back to Contents Page

[Back to Contents Page](#)

System Setup Program

Dell™ XPS™ 410 Service Manual

Overview

Use system setup as follows:

- To change the system configuration information after you add, change, or remove any hardware in your computer
- To set or change a user-selectable option, such as the user password
- To read the current amount of memory or set the type of hard drive installed
- To flash the BIOS with an update

Before you use system setup, it is recommended that you write down the system setup screen information for future reference.

NOTICE: Expert computer users *only* can safely change the settings for this program. Certain changes can cause your computer to work incorrectly.

Entering System Setup

1. Turn on (or restart) your computer.
2. When the blue DELL™ logo is displayed, watch for the F2 prompt to appear.
3. Once the F2 prompt appears, press <F2> immediately.

   NOTE: The F2 prompt indicates that the keyboard has initialized. If you press <F2> before you are prompted, the keystroke will be lost.

4. If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop, then shut down your computer (see Turning Off Your Computer) and try again.

System Setup Screens

The system setup screen displays current or changeable configuration information for your computer. Information on the screen is divided into three areas: the options list, active options field, and key functions.

Options List — This field appears on the left side of the system setup window. The field is a scrollable list containing features that define the configuration of your computer, including installed hardware, power conservation, and security features. Scroll up and down the list with the up- and down-arrow keys. As an option is highlighted, the **Option Field** displays more information about that option and the option's current and available settings. By pressing <Enter> or the left- and right-arrow keys, you can toggle between a primary topic (collapsed) and subtopics (expanded).	**Option Field** — This field contains information about each option. In this field you can view and make changes to your current settings. Use the right- and left-arrow keys to highlight an option. Press <Enter> to make that selection active.
	Key Functions — This field appears below the **Option Field** and lists keys and their functions within the active system setup field.

System Setup Options

NOTE: Depending on your computer and installed devices, the items listed in this section may not appear, or may not appear exactly as listed.

System	

System Info	Lists system information such as the computer name, the BIOS version number and date, system tags, and other system-specific information. **NOTE:** The system name listed in the BIOS may not appear exactly as the name that appears on the computer or in the computer's documentation.
CPU Info	Lists the processor type, processor bus speed, processor ID, clock speed, L2 cache, and additional features supported by your processor.
Memory Info	Indicates the type and amount of installed memory, memory speed, and channel mode (dual or single).
Date/Time	Displays current date and time settings.
Boot Sequence	The computer attempts to boot from the sequence of devices specified in this list. **NOTE:** If you insert a boot device and restart the computer, this option appears in the system setup menu. To boot from a USB memory device, select the USB device and move it (by pressing <U>) so that it becomes the first device in the list.

Drives	
Diskette Drive	Identifies and defines the floppy drive attached to the FLOPPY connector on the system board. The options restrict identification of drives to **USB only**, **Internal only**, or **none (Off)**. The **Read Only** option restricts the ability to boot from any floppy device.
SATA 0 through 5	Identifies the drives attached to the SATA connectors on the system board, and lists the capacity for hard drives.
SATA Operation	Identifies and defines the SATA controller settings for RAID. You can set the SATA controller to **RAID Autodetect/ATA** or **RAID On**.

Onboard Devices	
Integrated NIC	You can set the NIC to **On** (default), **Off**, or **On w/PXE**. When the **On w/PXE setting is active** (available only for the future boot process), the computer prompts you to press <Ctrl><Alt><b>. Pressing this key combination causes a menu to display that allows you to select a method for booting from a network server. If a boot routine is not available from the network server, the computer attempts to boot from the next device in the boot sequence list.
Integrated Audio	Enables or disables the onboard audio controller.
USB Controller	Set to **On** (default) so that USB devices will be detected and supported in the operating system.
USB for FlexBay	This field enables and disables the internal USB for FlexBay. • **Off** — Internal USB for FlexBay is disabled. • **On** — Internal USB for FlexBay is enabled. • **No Boot** — Internal USB for FlexBay is enabled but not bootable. The factory default setting is **No Boot**. **NOTE:** This USB option appears only if a FlexBay device is installed.
Rear Quad USB	Enables or disables the 4-stack of USB ports on the back of the computer.
Real Dual USB	Enables or disables the 2-stack of USB ports on the back of the computer.
Front USB	Enables or disables the 2-stack of USB ports on the front of the computer.
PS/2 mouse port	If your computer has the optional PS/2 mouse port, then this option is listed.

Video	
Primary Video	This setting specifies which video controller is primary when two video controllers are present on the computer.

Performance	
Multiple CPU Core	If your computer processor supports more than one core, this option appears in the Options List.
Virtualization	If your computer processor supports virtual technology, this option appears in the Options List.
SpeedStep	If your computer processor supports Intel® SpeedStep® technology, then this option is listed and it allows you to enable or disable support for this feature.
HyperThreading	If your computer processor supports Hyper-Threading, this option appears in the Options List.
HDD Acoustic Mode	• **Bypass (default)** — Your computer does not test or change the current acoustics mode setting. • **Quiet** — The hard drive operates at its most quiet setting. • **Suggested** — The hard drive operates at the level suggested by the drive manufacturer. • **Performance** — The hard drive operates at its maximum speed. **NOTE:** Switching to performance mode will cause the drive heads to move faster, causing the hard drive to be noisier. However, some drives may not see an increase in data transfer rates.

	NOTE: Changing the acoustics setting does not alter your hard drive image.

Security	
Admin Password	This option provides restricted access to the computer's system setup program in the same way that access to the system can be restricted with the **System Password** option.
System Password	Displays the current status of the system's password security feature and allows a new system password to be assigned and verified.
Password Status	This option locks the system password field with the setup password. When the field is locked, you can no longer disable password security by pressing <Ctrl><Enter> when the computer starts.
Execute Disable	Specifies whether Execute Disable Memory Protection Technology will be on or off.

Power Management	
AC Recovery	Determines what happens when AC power is restored to the computer.
Auto Power On	Sets the computer to automatically turn on. Choices are **every day** or every **Monday through Friday**. The default setting is **Off**. This feature does not work if you turn off your computer using a power strip or surge protector.
Auto Power Time	Sets time to automatically turn on the computer. Time is kept in the standard 12-hour format (*hours:minutes*). Change the startup time by pressing the right- or left-arrow key to increase or decrease the numbers, or type numbers in both the date and time fields. This feature does not work if you turn off your computer using a power strip or surge protector.
Remote Wake Up	This option allows the computer to power up when a NIC or Remote Wakeup-capable modem receives a wake up signal. **On** is the default setting. **On w/ Boot to NIC** allows the computer to attempt to boot from a network prior to using the boot sequence. **NOTE:** Normally, the system can be powered up remotely from suspend mode, hibernate mode, or when powered off.
Quick Resume	This feature enables/disables the Intel® Viiv™ Quick Resume Technology. The default setting is **Off**.

Maintenance	
Service Tag	Displays the system service tag which is a unique seven-digit alphanumeric system identifier.
SERR Message	Controls SERR message mechanism to support some add-in cards.
Load Defaults	Allows you to reset all options in the setup menu to the factory default.
Event Log	Displays the system event log.

POST Behavior	
Fastboot	When set to **On** (default), your computer starts more quickly because it skips certain configurations and tests.
Numlock Key	This option involves the rightmost bank of keys on your keyboard. When set to **On** (default), this option activates the numeric and mathematical features shown at the top of each key. When set to **Off**, this option activates the cursor-control functions labeled on the bottom of each key.
POST Hotkeys	This option allows you to specify the function keys to display on the screen when the computer starts.
Keyboard Errors	This option disables or enables keyboard error reporting when the computer starts.

Boot Sequence

This feature allows you to set the order in which the BIOS will search devices when trying to find an operating system.

NOTICE: If you modify any boot sequence settings, save the new settings to avoid losing the changes.

Option Settings

NOTE: The computer attempts to boot from all bootable devices, but if no bootable device is found, the computer generates an error message that states No boot device available. Press the <F1> key to retry the boot, or press the <F2> key to enter the setup utility.

- **Onboard or USB Floppy Drive —** The computer attempts to boot from the floppy drive. If there is no floppy in the drive or there is no floppy drive installed, the computer attempts to boot from the next bootable device in the sequence.

  NOTE: If there is a non-bootable floppy in the drive, the computer generates an error message. Follow the on-screen instructions to retry the boot.

- **Onboard SATA Hard Drive** — The computer attempts to boot from the primary hard drive. If no operating system is on the drive, the computer attempts to boot from the next bootable device.
- **Onboard or USB CD-ROM Drive** — The computer attempts to boot from the CD drive. If no CD is in the drive, or if the CD has no operating system, the computer attempts to boot from the next bootable device.
- **USB Device —** Insert the memory device into a USB port and restart the computer. When `F12 = Boot Menu` appears in the upper-right corner of the screen, press <F12>. The BIOS detects the device and adds the USB option to the boot menu.

  NOTE: To boot to a USB device, the device must be bootable. To ensure that your device is bootable, check the device documentation.

Changing Boot Sequence for the Current Boot

You can use this feature, for example, to restart your computer to a USB device such as a floppy drive, memory key, or CD-RW drive.

NOTE: If you are booting to a USB floppy drive, you must first set the floppy drive to OFF in system setup (see System Setup Options).

1. If you are booting to a USB device, connect the USB device to a USB connector (see Front View of the Computer).
2. Turn on (or restart) your computer.
3. When `F2 = Setup, F12 = Boot Menu` appears in the upper-right corner of the screen, press <F12>.

   If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop, then shut down your computer (see Turning Off Your Computer) and try again.

   The **Boot Device Menu** appears, listing all available boot devices. Each device has a number next to it.

4. At the bottom of the menu, enter the number of the device that is to be used for the current boot only.

   For example, if you are booting to a USB memory key, highlight **USB Device** and press <Enter>.

   NOTE: To boot to a USB device, the device must be bootable. To make sure your device is bootable, check the device documentation.

Changing Boot Sequence for Future Boots

1. Enter system setup (see Entering System Setup).
2. Use the arrow keys to highlight the **Boot Sequence** menu option, then press <Enter> to access the menu.

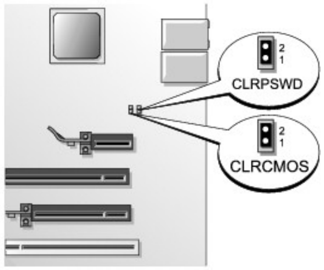
   NOTE: Write down your current boot sequence in case you want to restore it.

3. Press the up- and down-arrow keys to move through the list of devices.
4. Press the spacebar to enable or disable a device. Enabled devices have a number assigned to them; disabled devices have no number assigned.
5. Press <U> or <D> to move a selected device up or down the list.

Clearing Forgotten Passwords

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

1. Follow the procedures in Before Working Inside Your Computer.



2. Locate the 2-pin password jumper (CLRPSWD) on the system board (see System Board Components), and remove the jumper to clear the password.

   NOTE: When you receive your computer, the jumper plug is attached to pins 1 and 2.

3. Replace the computer cover (see Replacing the Computer Cover).
4. Connect your computer and monitor to electrical outlets, and then turn them on.
5. After the Microsoft® Windows® desktop appears on your computer, shut down the computer (see Turning Off Your Computer).
6. Turn off the monitor and disconnect it from the electrical outlet.
7. Disconnect the computer power cable from the electrical outlet, then press the power button to ground the system board.
8. Remove the computer cover (see Removing the Computer Cover).
9. Locate the 2-pin password jumper (CLRPSWD) on the system board (see System Board Components) and attach the jumper to pins 1 and 2 to re-enable the password feature.
10. Replace the computer cover (see Replacing the Computer Cover).

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

11. Connect your computer and devices to electrical outlets, and then turn them on.

Clearing CMOS Settings

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

1. Follow the procedures in Before Working Inside Your Computer.
2. Reset the current CMOS settings:
   a. Locate the 2-pin CMOS jumper (CLRCMOS) on the system board (see System Board Components).

   NOTE: When you receive your computer, there is no jumper plug on the CMOS jumper.

   b. Remove the jumper plug from the password jumper (CLRPSWD) pins 1 and 2.
   c. Place the jumper plug on the CMOS jumper (CLRCMOS) pins 1 and 2 and wait approximately five seconds.
   d. Remove the jumper plug and replace it on the password jumper (CLRPSWD) pins 1 and 2.
3. Replace the computer cover (see Replacing the Computer Cover).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

4. Connect your computer and devices to electrical outlets, and then turn them on.

Flashing the BIOS

The BIOS may require a new flash when an update is available or when replacing the system board.

1. Turn on the computer.
2. Locate the BIOS update file for your computer at **support.dell.com**.
3. Click **Download Now** to download the file.
4. If the **Export Compliance Disclaimer window** appears, click **Yes, I Accept the Agreement**.

   The **FIle Download window** appears.

5. Click **Save this program to disk** and then click **OK**.

   The **Save In window** appears.

6. Click the down arrow to view the **Save In** menu, select **Desktop**, and then click **Save**.

   The file downloads to your desktop.

7. Click Close when the **Download Complete** window appears.

   The file icon appears on your desktop and is titled the same as the download BIOS update file.

8. Double-click the file icon on the desktop and follow the on-screen instructions.

Back to Contents Page

Back to Contents Page

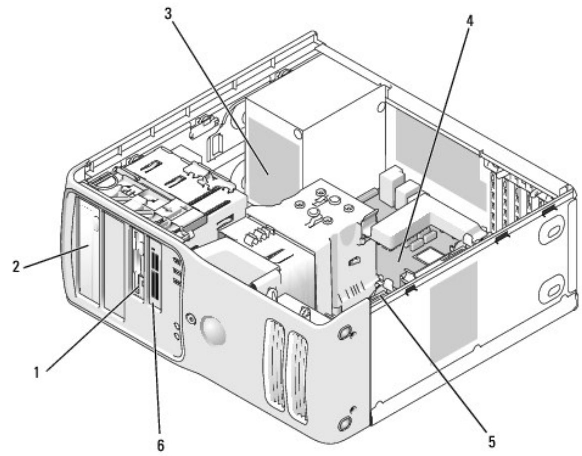
Technical Overview

Dell™ XPS™ 410 Service Manual

- Inside View of Your Computer
- System Board Components
- Power Supply DC Connector Pin Assignments

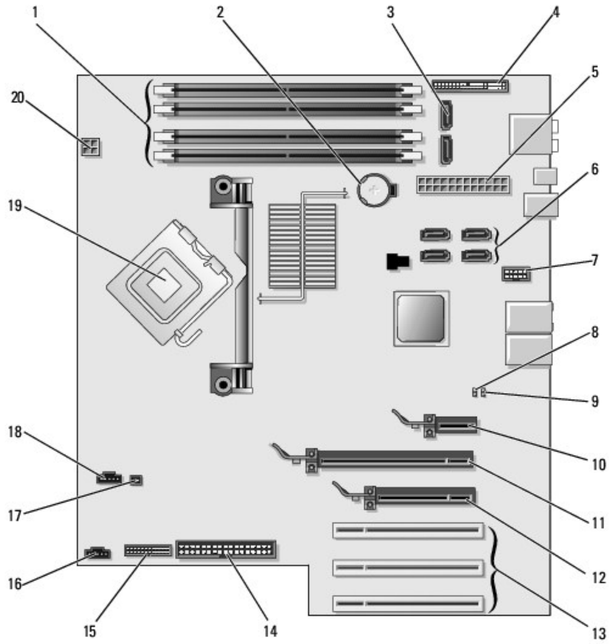
Inside View of Your Computer

CAUTION: Before you use this information in any of the procedures, follow the safety instructions in the *Product Information Guide*.



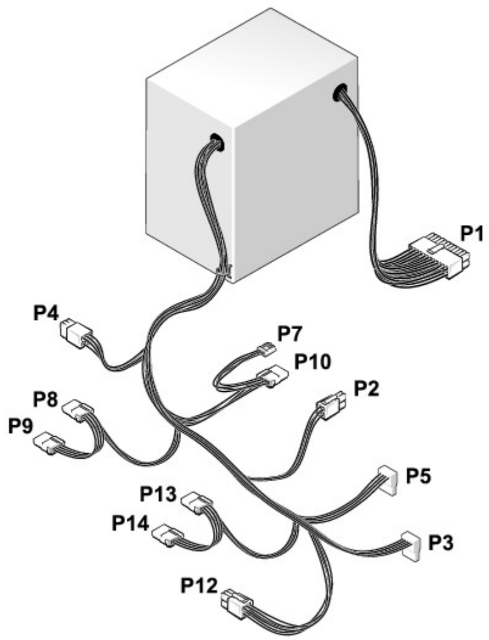
1	floppy drive (optional)	2	CD or DVD drive	3	power supply
4	system board	5	hard drive	6	media card reader (optional)

System Board Components

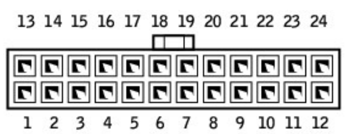


1	memory module connectors (1, 2, 3, 4)	2	battery socket (BATTERY)	3	SATA Connectors SATA0, SATA1
4	front panel I/O connector	5	main power connector	6	SATA connectors (4) (SATA2, SATA3, SATA4, SATA5
7	FlexBay USB connector	8	clear CMOS jumper (CLRCMOS)	9	password jumper (CLRPSWD)
10	PCI Express x1 card connector	11	PCI Express x16 card connector	12	PCI Express x4 card connector
13	PCI card connectors	14	floppy drive connector (FLOPPY)	15	PS/2 and Serial connector
16	rear fan connector	17	thermal sensor connector	18	CPU fan connector
19	processor and heat sink connector	20	processor power connector		

Power Supply DC Connector Pin Assignments



DC Power Connector P1



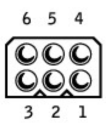
Pin Number	**Signal Name**	**Color**	**Wire Gauge**
1	+3.3 VDC	Orange	18-AWG
2	+3.3 VDC	Orange	18-AWG
3	COM	Black	18-AWG
4	+5 VDC	Red	18-AWG
5	COM	Black	18-AWG
6	+5 VDC	Red	18-AWG
7	COM	Black	18-AWG
8	POK	Gray	18-AWG
9	+5 VFP	Purple	18-AWG
10	+12 VB DC	White	18-AWG
11	+12VB DC	White	18-AWG
12	+3.3 VDC	Orange	18-AWG
13	+3.3 VDC	Orange	18-AWG
14	-12 VDC	Blue	18-AWG
15	COM	Black	18-AWG
16	PS-ON	Green	18-AWG
17	COM	Black	18-AWG
18	COM	Black	18-AWG
19	COM	Black	18-AWG
20	N/C	N/C	18-AWG
21	+5 VDC	Red	18-AWG
22	+5 VDC	Red	18-AWG
23	+5 VDC	Red	18-AWG
24	COM	Black	18-AWG

DC Power Connector P2



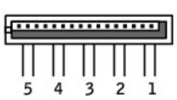
Pin Number	Signal Name	18-AWG Wire
1	COM	Black
2	COM	Black
3	+12 VA DC	Yellow
4	+12 VA DC	Yellow

DC Power Connect P4



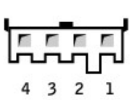
Pin Number	Signal Name	18-AWG Wire
1	N/C	N/C
2	COM	Black
3	COM	Black
4	+3.3 VDC	Orange
5	+5 VDC	Red
6	+12A VDC	Yellow

DC Power Connect P3, P5, P8, P9, P13, and P14



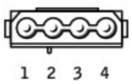
Pin Number	Signal Name	18-AWG Wire
1	+3.3 VDC	Orange
2	COM	Black
3	+5 VDC	Red
4	COM	Black
5	+12 VB DC	White

DC Power Connector P7



Pin Number	Signal Name	18-AWG Wire
1	+5 VDC	Red
2	COM	Black
3	COM	Black
4	+12 A VDC	Yellow

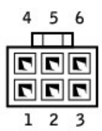
DC Power Connectors P10



Pin Number	Signal Name	18-AWG Wire
1	+12 VA DC	Yellow
2	COM	Black
3	COM	Black
4	+5V DC	Red

NOTE: The P10 connector is intended for use with PCI Express graphics cards that have power requirements exceeding 75 watts.

DC Power Connector P12



Pin Number	Signal Name	18-AWG Wire
1	+12 B VDC	White
2	+12 B VDC	White
3	+12 B VDC	White
4	COM	Black
5	COM	Black
6	COM	Black

Back to Contents Page